AIR CONDITIONING HEATING & REFRIGERATION NEWS

The Newspaper of the Industry

RESIDENTIAL — COMMERCIAL — INDUSTRIAL

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Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Stories of the Week
Variation No. 37
Gags of the Week
Air Conditioning Softens John L. Lewis—Up
Romney's Right
Space Travel Note

Stories of the Week

"And then," the male half of a dance team described his act to an agent, "I grab my partner by her long blonde hair, whirl her around my head ten times, and toss her into the fifth row of seats."

Agent nearly swallowed his cigar butt.

"You do this at every performance?"

"Well," admitted the adagio performer, "sometimes I miss the fifth row."

Raymond Massey, who now is playing the Deity in the Broadway production, "J.B.," won early fame in an Abraham Lincoln role.

Here's a fellow who started at the top and went higher. He has progressed from acting Lincoln to enacting God.

Variation No. 37

Spaceship lands in the Frozen North, near an Eskimo igloo.

"Take me," says the Martian who emerges, "to your heater."

Gags of the Week

Suggested gift for music lovers: 20 rock-and-roll records and a hammer.

At the box office, Briggitte Bardot movies outdraw the westerns.

This should teach our kids a lesson. You don't have to steal and shoot and kill to be popular.

Nothing makes some people go into debt like trying to keep up with people who already are.—O. A. BATTISTA.

We all recognize that the path to individual prosperity is to save. Why then do so many assume that the way to national prosperity is to spend?—*Industrial Press Service.*

Air Conditioning Softens John L. Lewis—Up

Buried obscurely in a recent *Saturday Evening Post* article on "the new John L. Lewis" is the REAL reason why coal miners and coal mine operators are prospering.

(Concluded on Page 14, Col. 1)

Mueller Climatrol Lines Featuring 'Humidity Control'

PHILADELPHIA—Design innovations in several new models, together with a number of new features and accessories, marked the introduction of the 1959 Mueller Climatrol line of year-round, summer, and winter residential air conditioning equipment.

Spotlighted in the 1959 products offered by the Mueller Climatrol Div. of Worthington Corp. are:

(1) A summer central air conditioning unit for which positive humidity control is claimed through the use of two independent cooling cycles.

(2) Expansion of the heat pump line, which now includes 3-hp. and 4-hp. units, completely pre-assembled and precharged packaged horizontal systems.

(3) An electric humidifier for furnace installation, to provide humidification at a rate up to 26 quarts per day.

(4) A new winter air conditioner with features such as "Levelizer" variable input gas valve, built-in electronic air cleaner, and clogged filter indicators.

As described by H. P. Mueller, Jr. and R. Signorelli of the company, the "positive humidity control" air conditioning unit is designed to "provide dehumidification when the temperature falls below the normal thermostat setting of from 72 to 76°." They stated that dehumidifying

(Concluded on Page 17, Col. 1)

Industry Firms Not Hit By St. Louis Tornado

ST. LOUIS — The tornado which hit St. Louis early last week did not damage any of the air conditioning and refrigeration equipment and components manufacturing plants, of which there is a rather heavy concentration in the St. Louis area, according to information available at press time.

So far as could be determined at the time this issue goes to press, none of the casualties were persons who had connections in the industry.

Ranney Roof 'Staggered' But Didn't Collapse

GREENVILLE, Mich.—Press reports that the roof of the Ranney Refrigerator Co. warehouse here had collapsed under the weight of heavy snows were denied by G. F. Ranney, factory manager.

"It staggered a little," Ranney admitted, "under the weight of 15 to 20 in. of packed down snow, but no damage was done to the warehouse or its contents."

'$1.25 Bid' To Cool Capeharts Starts Hassle

DETROIT—No, you certainly can't air condition 800 Capehart housing units for $1.25 each!

This was acknowledged by West Coast Building Contractor Hal B. Hayes in defending his apparently successful bid on a $13 million housing project at Camp Lejeune, N. C.

Hayes spoke out after the awarding of the construction contract to his Atlantic Contractors, Inc., North Hollywood, Calif., prompted several contrac-

(Concluded on Page 33, Col. 1)

Heat Pump Service Cost 'Less Than $5 per Ton First Year'

PHILADELPHIA — Service costs on 33 General Electric heat pumps during their first year of operation averaged out at $17.40 per unit—with more than half the units requiring no service at all, according to a contractor in the audience during the heat pump symposium held recently at the 65th annual meeting of the American Society of Heating & Air-Conditioning Engineers.

Broken down, this cost came to less than $5 per ton for the first year. This figure is on the heat pump unit itself and does not include ductwork, water lines, and the like.

The significance of this figure was immediately challenged by others in the audience on the basis that "a true cost comparison can only be made after units have been in operation several years."

In fact, performance data and cost figures presented by a five-member panel were repeatedly challenged from the floor on basis of "incompleteness," "taking into consideration load factors which are not comparable with conventional heating," and "inability to show long-range operating costs to compare with readily available data on conventional heating."

In addition, floor discussion brought out several significant pieces of miscellaneous informa-

(Continued on Page 26, Col. 1)

Exposition Pictures

Many new products which were shown at the 14th International Heating & Air Conditioning Exposition held in Philadelphia recently are pictured in this issue on pages 24, 25, 28, 30, 31, and 32. Other pictures appeared in the Feb. 9 issue and additional picture coverage of the show will be contained in a subsequent issue.

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'Schools for Customer Satisfaction' Launch G-E Merchandising Policy

TYLER, Texas — With its "Schools for Customer Satisfaction" launched, General Electric Co.'s Air Conditioning Dept. has taken the initial steps in its "Customer Satisfaction" program, which it announced late last year would be its merchandising theme and over-all policy for 1959 and future years.

In distributor meetings last Fall, G-E Air Conditioning Dept. executives outlined the five basic elements which make up customer satisfaction as follows: Product. Application. Installation. Service. Selling.

In outlining the program of "Schools for Customer Satisfaction," company officials are concentrating on the theme that "satisfied customers" will "help you sell your products and your service" and that the schools are designed to help the dealer increase the number of satisfied customers.

The complete course for the school consists of two "semesters" plus a home study requirement. The breakdown of the course is as follows:

First "semester" is what might be called a "starter course" which is designed to establish a "level" for the advanced course or the second semester. This two-day "starter course" is being taken to more than 30 cities throughout the

(Concluded on Page 33, Col. 1)

Bell & Gossett Line 'Built Low, Compact'

MORTON GROVE, Ill. — A complete line of commercial and industrial refrigeration condensing units, ranging in size from 7½ to 150 tons' capacity, has been announced by Bell & Gossett Co.

M. H. Hofmeister, manager of Bell & Gossett's Air Conditioning Div., stressed the shortness of the new models, which are "built low and compact." The 7½-ton unit, for example, is only 54 in. in length, he noted.

(Concluded on Page 33, Col. 3)

Copeland Net Sales For Fiscal 1958 Highest In History

SIDNEY, Ohio—Net sales of $30,194,748 for the fiscal year ended Sept. 30, 1958, highest in the company's history, was reported by Copeland Refrigeration Corp. in its report to shareholders following the company's recent annual meeting.

For the first four months of the current fiscal year Copeland reports a 30% increase in sales volume, with incoming orders running commensurately. Based on this performance, Copeland officials have budgeted for a $40 million sales volume for the fiscal year 1959.

At the annual meeting, Frank J. Gleason, Jr., was elected to the corporate office of controller. For the past three years he has been associated with Ernst & Ernst, a national firm of accountants, at the firm's main office staff headquarters in Cleveland.

Gleason

Copeland's earnings for its

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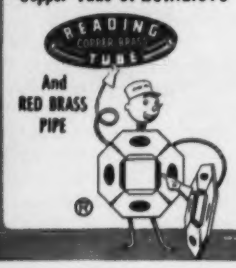

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for Refrigeration &
Air Conditioning Equipment

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EMPIRE STATE BUILDING NEW YORK 1, N. Y.
WORKS: READING, PA.

Detroit Area Reciprocal Council Makes Code Changes, Names Advisory Group

HIGHLAND PARK, Mich. — The city of Allen Park has adopted the new refrigeration code recommended by the Reciprocal Refrigeration Council, it was reported at the January meeting of the council.

The Reciprocal Refrigeration Council is promoting reciprocal refrigeration licensing among communities in the Detroit area so that a contractor licensed in one community can operate in another by registering his license there.

Next meeting of the council will be at 2 p.m. Feb. 18 in the Highland Park city council chamber.

The council also approved three changes in wording in the recommended code and appointed an advisory committee. Election of officers was postponed for 90 days.

The code was altered to require a city permit for installation of any air conditioner where it projects over public sidewalks or thoroughfares.

Another change would require annual inspections *in other than single and two-family residences* of refrigerating systems used for purposes other than air conditioning for human comfort when actuated by motors or engines having a standard rating of more than 1 hp.

The third change would specify that no window air conditioner shall extend beyond the building in such a manner as to create a *hazard* (rather than an obstacle) to pedestrian or vehicular traffic, nor shall encroach into a required yard.

The new advisory committee consists of George Asher, representing the Better Heating & Cooling Bureau; E. G. Behm of Michigan Consolidated Gas Co. representing utilities; Carl Beltz, representing the Detroit Warm Air Heating Association; R. E. Miller representing the Mechanical Contractors Association; and Blair Moody, Jr., representing the Refrigeration & Air Conditioning Contractors Association of Detroit.

California RACCAs Form State Council

PEBBLE BEACH, Calif. — The California Council of Refrigeration & Air Conditioning Contractors Associations was organized here recently at a meeting of association representatives.

The council has been organized for the purpose of dealing with state legislative matters affecting the industry, promoting freedom of movement sections of labor contracts, participating in a state-wide joint apprenticeship training council with the unions, and with the intent of forming a joint industry council in California for discussion of contractor problems with distributors, manufacturers, and wholesalers.

Represented at the organization meeting were Inland Air Conditioning & Refrigeration Contractor Association (Riverside and San Bernardino counties), RACCA of Southern California, and RACCA of Northern California. RACCA of San Diego is expected to join.

The council appointed a temporary board of 10 members.

Following organization the council met next day at a breakfast meeting with representatives of the United Association, including Charles Voss, UA international organizer of its refrigeration and air conditioning department for the 16 western states.

The unions were advised of the formation of the California Council of RACCAs. On behalf of UA unions, Voss announced that the unions were particularly pleased with the formation of the council and hoped to work with it.

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space in your building
FOUND
with

KRAMER
OUTDOOR COMPRESSOR

Why lose dollar-making storage and selling space to house compressors, when you can now use the Kramer Outdoor Compressor? The THERMOBANK COMPRESSOR SYSTEM is factory assembled, tested and run-in; it saves installation time and money.

The refrigeration industry again finds Kramer blazing a new path with its THERMOBANK SYSTEM—the original and only automatic re-evaporating, non-overloading, fastest hot gas defrost system—now engineered to perform unfailingly, not only in a heated space but in any unheated space or outside at any outdoor temperature.

WRITE FOR BULLETIN TC 406A

KRAMER TRENTON CO. Trenton 5, N. J.
45 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

20,000-HOUR OPERATION FROM ONE LUBRICATION

Unique lubrication system of both Shaded-Pole and Permanent-Capacitor motors assures longer, trouble-free operation

The best appliance made is no more efficient than its motor. And the motor is no better than its lubrication system.

Delco's new, shorter fan motors use a highly advanced oil impregnated fibrous material which results in a more desirable feeding rate of oil to the bearing, more than adequate supply of oil in the reservoir, and excellent oil retention in the oil well. Life tests show that this lubrication system in the newly designed SS and PC direct drive fan motors is suitable for more than 20,000 hours of operation without relubrication (equivalent to 5 years of use). The rest of the motor is designed to match the lubrication system in durability. This is the type of motor dependability you should expect in your product.

Both the SS and PC motors are available with one or both end frames enclosed and either enclosed or ventilated main frames for maximum flexibility in product design. The 5½" line of motors is available in SS ratings of 1/15 through 1/4 HP, and PC ratings of 1/15 through 1/3 HP. Both are available in a wide choice of mountings.

Contact your Delco Products sales office for complete details. Find out what advantages this new motor has to offer your product.

FLEXIBLE ELECTRICAL CONNECTION—Attachment of leads from your wiring harness is fast and easy. They go directly to a built-in terminal block. Also available with various lead lengths attached to terminal block or connected direct to winding.

ADAPTABLE MOUNTING RING—The removal of the mounting ring provides a completely flat end frame for thru-bolt or belly-band mounting. Mounting rings, bases, and base clamps are available.

RUST RESISTANT THROUGHOUT—All metal parts are specially treated to resist rust and corrosion.

MOISTURE RESISTANT INSULATION—Insulation components offer maximum protection against moisture in high-humidity air-conditioning applications.

GM GENERAL MOTORS DELCO

DELCO MOTORS

Delco Products, Division of General Motors, Dayton, Ohio

- APPLIANCE MOTORS • INDUSTRIAL MOTORS
- GENERATORS • ACTUATORS
- AUTOMOTIVE AND HYDRAULIC EQUIPMENT
- HERMETIC MOTORS AND CONTROLS
- RESIDENTIAL GARAGE DOOR OPERATORS
- AIR SUSPENSION COMPONENTS

Supplement to 'Directory of Certified Unitary Air Conditioners' Adds 3 Firms

WASHINGTON, D. C. — The first (February, 1959) supplement to the "Directory of Certified Unitary Air Conditioners" was distributed recently by the Air-Conditioning & Refrigeration Institute under the certification program for unitary air conditioners which got under way Jan. 1.

The initial directory was distributed early in January.

The first supplement includes the names of three new manufacturers who have signed contracts to participate in the program since the directory was issued, bringing to 33 the number of participating companies.

They are Curtis Mfg. Co., St. Louis; Friedrich Refrigerators, Inc., San Antonio; and Gaffers & Sattler, Div. of Utility Appliance Corp., Los Angeles.

Listings of model ratings of four companies, whose ratings did not appear in the directory originally, are included in the supplement: Curtis Mfg., Friedrich Refrigerators, U. S. Air Conditioning Corp., and Westinghouse Electric Corp., Air Conditioning Div.

In addition, York Div., Borg-Warner Corp., has added ratings of two lines of units not included in its listings in the January directory.

Amendments to earlier ratings have been filed by companies whose ratings appeared in the first directory. They are:

Airtemp Div., Chrysler Corp.; Amana Refrigeration, Inc.; American Furnace Co.; General Electric Co.; Hall-Neal Furnace Co.; National-U.S. Radiator Corp.; Peerless Corp.; Round Oak Co.; The Trane Co.; Typhoon Air Conditioning Co., Div. of Hupp Corp.; Worthington Corp.; and York.

The supplement is being sent to the recipients of the initial directory, plus those dealers, contractors, architects, consulting engineers, and others, who have requested to be placed on the mailing list for supplements. It is also available through Better Business Bureaus throughout the country.

Trying to find the right man for a hard-to-fill vacancy—the NEWS' Classified Ads are read by your man.

Place your ad today!

Freezer Sales Up 19%-- NEMA

NEW YORK CITY—Total industry sales (including exports) of electric farm and home freezers in 1958 rose 19% compared with 1957 but those of electric household refrigerators were off 7%, according to statistics issued by the National Electrical Manufacturers Association.

Sales of 65,600 freezers in December pushed total sales for 1958 to 1,100,900, against 925,000 in 1957. December sales in 1957 amounted to 47,400.

Refrigerator sales in 1958 dropped to 3,116,700, from 3,350,000 in the previous year. Sales of refrigerators in December rose to 286,900 from the 214,600 sold in the year-earlier month.

Buffalo Council Ok's Warm Air Code

BUFFALO — Without comment or discussion, the Common Council unanimously approved a new residential warm air heating code, worked out by a number of city agencies with the help of heating contractors and installers.

The code provides for licensing heating contractors and creates a five-member board to examine applicants. It covers all installations and replacements of space-heating equipment on residential premises "where the B.t.u. loss is 250,000 units or less."

The council's action must be ratified by the mayor before it goes into effect and he would name the five-member board.

Get factory-sealed assurance that your refrigerants are free of impurities, low in moisture, accurate in weight by specifying Pennsalt Isotron®. Pennsalt is the originator of factory-sealed refrigerants . . . gives you this guarantee with Isotrons in both cylinders and convenient, disposable Handi-Can containers.

Isotrons are produced in the nation's most modern fluorinated refrigerants plant. They're *extra*-pure and *extra*-dry when made and packaged . . . *stay* extra-pure and extra-dry until you use them.

Be safe, be sure. When you buy refrigerants, get Isotrons in tamper-proof containers packed and sealed by the original producer. Write or call for further information. Isotron Department 672, Pennsalt Chemicals Corp., 3 Penn Center, Phila. 2, Pa.

ISOTRON Refrigerant 11 (CCl_3F)
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ISOTRON Refrigerant 22 ($CHClF_2$)
ISOTRON Refrigerant 113 (CCl_2F-$CClF_2$)
ISOTRON Refrigerant 114 ($CClF_2$-$CClF_2$)

when you buy refrigerants...

look for this seal

... your guarantee of PURITY, DRYNESS, CORRECT WEIGHT

ISOTRON
THE KEY TO MODERN LIVING

Pennsalt Chemicals
ESTABLISHED 1850

Detroit Controls Names Amneus, Campbell, Noakes

DETROIT — F. J. Kreissl, president of the Detroit Controls Div. of American Standard, has announced three appointments.

J. S. Amneus

R. L. Campbell

T. E. Noakes

Kreissl named John S. Amneus manager of research and advanced development; Richard L. Campbell, divisional director of engineering; and Thomas E. Noakes, chief engineer, Detroit products.

Amneus has worked for Detroit Controls since 1951 when he became chief mechanical engineer for the Research Div.

Campbell has been with the parent organization since 1925 and with Detroit Controls since 1933. For the division he has managed the Gas Controls and Heating Controls divisions, "Vernatherm" sales, and product engineering.

Noakes has worked for the division since 1935, progressing through a series of engineering posts and most recently was manager of advanced engineering.

Where To Get Thermoelements

Requests for the simple thermoelements mentioned in the NEWS' "Introduction to Thermoelectric Refrigeration," should be directed to: Semiconductors and Materials Div., Radio Corp. of America, Somerville, N. J. Thermoelements are reported to be selling for about $5

GO WITH CARRIER ON A 6 DAY Caribbean HOLIDAY

ALL EXPENSES PAID!

WHAT'S IN IT FOR YOU?

Six days and five nights, a lifetime memory of a glamour spot on a Caribbean island. You'll enjoy vivid night clubs, open-air sidewalk cafes, jai alai, exotic tropical rhythms, beautiful beaches on the blue waters of the Caribbean. You'll travel on Pan American's clipper flight, live in the lap of luxury at a famous hotel, dine at the best restaurants, have cocktails at fashionable supper clubs. You'll see glamorous floor shows and exciting sporting events, go dancing to the music of name bands, sightseeing in the haunts of the old buccaneers. And best of all, you can do everything and see everything and leave your pocketbook at home! You'll be the guest of Carrier Corporation and its distributors. They pick up the tab from the moment you leave your home town.

WHAT DO YOU DO?

Just enter the Go with Carrier Contest ending October 1, 1959. You can win an all-expense-paid Caribbean Holiday on your sales record. Your Carrier Distributor has all the facts on when you'll go, how you'll travel, what you'll see. Get in touch with him. You'll find his name in the Yellow Pages of the telephone book. Or write Carrier Corporation, Syracuse, New York.

BETTER AIR CONDITIONING FOR EVERYBODY EVERYWHERE

Carrier

York Outlines 9-Plank Franchise Platform In Move To Line Up 5,000 'Blue Chip' Dealers

DETROIT — York Corp., a subsidiary of Borg-Warner Corp. aims to line up 5,000 "Blue Chip" dealers this year who will sell values, features, benefits, and service instead of price.

York officials, appearing at a dealer meeting sponsored by York-Detroit Wholesalers here, outlined a nine-plank "Blue Chip Franchise" program as the company's distributing policy for 1959.

"Our distributors are pledged to selective dealer representation," Walter Landmesser, manager of packaged products distribution for York, declared.

"They will train, educate, and actually live with those selected dealers who are willing to make fair, reasonable profit their byword by selling creatively, installing in a careful, workmanlike manner, and servicing promptly and efficiently."

Other planks in the platform are, briefly stated:

To market products with quality built in that you can hear, see, and feel.

To give the consumer a dollar's value for a dollar spent.

To use sensible, believable national and local advertising to manufacturer prospects for distributors and dealers.

To provide sales plans and tools consistent with selling a Blue Chip product.

To assure distributor and dealer profits by working closely with them to see that sales plans are executed to the best of their ability.

To acknowledge mistakes, correct them, and see that they are not repeated.

To invest a large share of profits in continuing research and engineering.

To obtain and keep dealers who do a good creative selling job, render good service, and keep their customers happy.

Landmesser advised the dealers who had come to see York's new product lines (described in the Nov. 17, 1958 issue of the NEWS) that to make money by selling they must:

1. Have an aggressive mind.
2. Have adequate resources.
3. Have and follow a plan of action.

The first two without the third are useless, he said.

Jim Farrell, manager of room air conditioner sales for York, told dealers they will be doing their customers a favor by urging them to purchase their room units before the 10% excise tax is applied.

While noting that the Internal Revenue Service has not yet announced an effective date for extending the excise tax to cover larger size room units, Farrell said the excise tax committee of the Air-Conditioning & Refrigeration Institute believes that it will be applied April 1 to units of less than 20,000 B.t.u. capacity.

"All units in inventory on the effective date will be subject to the tax," he indicated.

Farrell also told the dealers that half the room air conditioners in the United States are sold through appliance dealers. The other half are sold through refrigeration contractors and other channels of distribution.

Richard English, York central regional manager at Chicago, anticipates that 40 to 50% of the commercial air conditioning installed in the next year or two will be with air-cooled condensing units.

He urged commercial air conditioning dealers not to overlook the advantages of lease plan selling. It can be used profitably in small business as well as large.

He pointed out that York dealers, in the 18 months York has had a lease plan, have leased equipment to barber shops, wine cellers, drugstores, bars, insurance company branch offices, motels, bowling alleys, and even to a sand scow.

A single small town dealer—Bill Magers of Springfield, Mo. —leased $20,000 worth of equipment last year to such outlets as a trucker's freight office, an auto dealership, and a bar, he added.

English said that as an inducement for pre-season sales this year, York and its distributors will pay for a billboard announcement of the installation of York air conditioning and place it near the customer's place of business.

William Goldsmith, York's residential air conditioning manager, asserted that York is keeping its five-year guarantee on its compressor. The company surveyed its dealers on the question and they asked that York retain the five-year guarantee, he said.

Goldsmith also reported that York sold more residential air conditioning equipment last year than in 1957, despite an industry-wide decline in sales in that field.

He indicated that the company is not going to promote heat pump sales this year in areas where the electric rate is more than 1.5 cents per kwh.

Deane Worlein, branch manager, announced that York-Detroit Wholesalers has added the Reznor line of industrial heating equipment for distribution in Michigan.

Markson, Jessup Appointed by Betz

DANVILLE, Ill. — H. Blake Thomas, vice president of Bohn Aluminum & Brass Corp. and general manager of the Betz Div., has announced the appointment of Wesley H. Markson as administrative sales manager and Donald J. Jessup as manager of the Unit Dept.

Markson

Jessup

Markson will correlate the work of the Coil and Unit departments and handle sales promotion and advertising. Jessup will be responsible for the development and sale of all unitary equipment.

Thomas stated that the appointments were made to expand wholesaler contacts and improve customer service.

2 MORE IMPORTANT CONTRIBUTIONS TO THE REFRIGERATION INDUSTRY

Designed and Pioneered by ALCO

1 The new Alco designed CONTOUR POWER ASSEMBLY

Reduces extreme and unnecessary flexing of the diaphragm. Increases diaphragm life as much as 10 times over other designs. Standard construction on all ALCO "T" Series and "HTL" Valves.

2 The new Alco designed RAPID RESPONSE REMOTE BULB & WELL

- Reduces danger of floodback
- Extra-quick closing response
- Better control over wider range of operating conditions
- Economical to install in package units
- Available on all Alco Gas Charged Valves if specified.

Look to Alco for advances in refrigerant controls.

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• BUY QUALITY
• BUY ALCO

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The one complete line of refrigerant controls: Thermostatic Expansion Valves • Refrigerant Distributors Solenoid Valves • Suction Line Regulators • Flooded Evaporator Controls and Reversing Valves

'Certified Agency Program' To Reach Communities Not Served by FHA Offices

WASHINGTON, D. C. — Federal Housing Administration's Certified Agency Program (CAP), which is aimed at providing the benefits of FHA mortgage insurance to the people in communities not easily served by field offices, will be expanded on a nationwide basis in the near future.

CAP will supplement present FHA programs.

Effective date of the CAP expansion, which has been operated on an experimental basis in selected areas of the United States the past year, will be contingent upon Congress extending insurance authorization.

Under the program, authorized agents are appointed in communities not reached by FHA field officies. These certified agents process applications and issue commitments for mortgage insurance under supervision of the field offices.

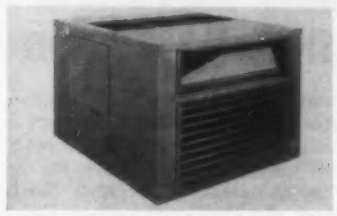
Carrier Offers One-Piece Heat Pump for Small Homes

SYRACUSE, N. Y.—A new 2-hp. heat pump designed for small homes and multi-unit structures has been introduced by Carrier Corp.

The "Heat Pump Weathermaker," more compact than previous models, is the first one-piece unit produced by the company for whole house air conditioning. Its cabinet is less than 3 ft. sq. and can be located outside the house for simple installation and service.

"The new unit has a cooling capacity of 22,000 B.t.u. and heating output of 23,000 B.t.u. with additional strip heaters available at 10,000 B.t.u. each," it was stated.

"Automatic defrosting is actuated every 90 minutes if necessary. The operation starts only if the outdoor temperature is in the range where frost will form. This is the same device used on larger Carrier heat pump systems.



NEW one-piece, 2-hp. heat pump from Carrier Corp. is designed for the small home market and multi-unit structures. It represents a complete central heating and cooling system that can be placed on a 3-ft. sq. slab outside the house. Because of its simplicity, it represents substantial savings in initial cost and operation over previous heat pump models and other methods of year-round air conditioning, Carrier claims. It has an automatic defrost cycle only when the outside coils become frosted.

"Separate fan motors increase efficiency by permitting constant recirculation of inside air without operation of the outside fan. Defrost is accomplished in five minutes because no cold air is drawn into the unit while the outside fan is in operation.

"Besides a room thermostat which automatically switches the unit from heating to cooling as required, the Carrier heat pump has an 'Econostat' located outside to actuate strip heaters when temperatures fall below certain levels. This prevents the main system from operating each time the unit demands heat."

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

I-B-R Appoints John Woodworth

NEW YORK CITY—Appointment of John I. Woodworth as administrative assistant to the general manager was announced by the Institute of Boiler & Radiator Manufacturers.

Woodworth will assist the I-B-R staff in carrying out a growing number of technical projects for the industry, including the expansion of I-B-R ratings, development of new codes, production of I-B-R publications, and interpretation of research reports, according to General Manager Robert E. Ferry.

Associated with the hydronics industry for 10 years, Woodworth comes to I-B-R with an engineering and sales background. He has been engaged in hydronic research, design, and application work and also has had experience in the refrigeration and air conditioning fields.

Nashville Firm Changes Name, Elects Officials

NASHVILLE, Tenn.—Parker-Mathes Air Conditioning, Inc., 3009 Powell Ave., has changed the corporate name of the firm to Builders Air Conditioning & Heating Co., Inc.

Two new officials were elected. Charles Gary was promoted from assistant general manager to general manager, replacing Carl Parker, who resigned, and Larry Zarth was advanced from the service department to service installation superintendent.

According to Gary, the two-year-old firm changed its name "to be more in line with its operation. It will intensify its specialization in the builder field."

Gary added that his firm sells, installs, and services all types of heating and air conditioning products. Recent large jobs included 91 year-round systems in Gaines & Gaines Treppard Heights homes, and 23 in Martin Construction Co.'s Sunset View homes.

Kelvinator Announces Training Course for District Managers

DETROIT—A six-day intensive training course for district managers has been announced by Kelvinator.

The program, which began here Jan. 19, will continue periodically throughout 1959.

Homer L. Travis, Kelvinator vice president in charge of sales, said this training "is primarily aimed at giving the district managers the tools and knowledge to be of even greater assistance to their dealers."

The program is patterned along the lines of NARDA's Institute of Management.

PEOPLE PUT THE PLUS IN VIKING TUBING
Viking's position as one of the nation's leading suppliers of thin-wall copper tubing has been achieved through the skill and dependability of the people at Viking.
Since Viking specializes in the manufacture of copper tubing for the refrigeration and air conditioning industry, Viking people are experts in the field. They know the importance of rigid adherence to the highest standards of temper, tolerance and uniformity to meet the customer's most exacting needs and specifications. They gear themselves to the needs of customers . . . adjusting and revising production and delivery schedules to conform to standard or emergency demands.
As a result, Viking quality and Viking service add up to a valuable plus for manufacturers of air conditioning and refrigeration units and coils.
The people at Viking will gladly discuss your copper tube requirements with you . . . you'll find the plus pays dividends.
VIKING
COPPER TUBE CO.
CLEVELAND 10, OHIO
PRECISION DRAWN SEAMLESS COPPER TUBE

Bleed-Off, Anti-Freeze, Boiler Scale Discussed at ASHAE Corrosion Symposium

PHILADELPHIA—"Bleed-off is necessary for proper cooling tower operation."

"While bleed-off is frequently *desirable,* it certainly cannot be considered *essential* for proper cooling tower operation."

"Cleaning of shell-and-tube condensers is not needed if proper water treatment has been used."

"On the contrary, no matter how well engineered a preventive maintenance program is, the human beings which operate it will make necessary the occasional shutdown and cleaning of some pieces of equipment," countered Mrs. Olivia P. Burkey, general manager, Chemical Solvent Co., in an unusually frank exchange of authoritative opinions on water treatment and corrosion during a symposium held here recently at the 65th annual meeting of the American Society of Heating & Air-Conditioning Engineers.

Five authorities spoke on several phases of the subject, and floor discussion was more at the level of service meetings than engineering, pointing up the obvious lack of general and specific knowledge on the part of the otherwise highly professional audience.

It was Mrs. Burkey who took the position that correct water treatment and periodic cleaning of sumps make bleed-off unnecessary in many instances. "In fact, even with bleed-off, it is necessary periodically to clean the sump," she insisted.

"Areas with drought conditions have restricted use of bleed, and the installations are not suffering. Further, owner/operators hate to see their money trickling away in bleed water, so they stuff a potato over the bleed, again with no serious effects."

Specific Suggestions on Water Treatment

After giving a brief description of the chemistry of water and its corrosion potential, Mrs. Burkey offered specific suggestions on water treatment and chemical cleaning:

1. "Standing alone, the fact that water is either soft or hard does not indicate whether treatment is needed or not. A complete analysis of the water, any scale formed, and the application of common sense all enter the picture."

2. "It is not possible to say that cleaning should be done at any specified times, like once at the beginning and once at the end of a season. Use a rule from biology: 'The specimen, not the book is the true authority.' Let the system tell you; don't tell it."

3. "Unless it is absolutely necessary due to the nature of the scale, we do not recommend the use of liquid acid cleaners—including our own. Choose a dry cleaner; they are more convenient to use and much, much safer."

4. "Clean the sump and flush out the system before applying cleaning chemicals. Why waste cleaner to dissolve matter which can be washed away?"

One Product Will Not Handle All Algae

5. "There are seven families of algae. Don't expect any one product to be effective against all seven. Algaecides based on chlorine or derivative, or on copper sulfate may destroy connective fibers in wood or wood fill towers."

Proper specifications, if adopted, can put water treatment and corrosion control on a more scientific basis, according to W. L. Andrews, manager, technical department, Bird-Archer Co., Ltd., Ontario. "A full case history should be given the water treatment company, just as you would give a doctor," suggested Andrews.

Outlining such items as water analysis, metals and materials involved, and frequency of examination which should be included in specifications, he concluded, "Do not buy service which cannot be explained by known laws of chemistry and physics."

System Design Can Have Important Effect

System design, with thought given to such factors as velocity, crevices, cleanliness, and direction of flow, can have an important bearing on corrosion, warned F. S. Hodgdon, associate chief engineer, Metropolitan Refining Co., who also warned against what he termed "pseudo-scientific water treatment gadgets."

Hodgdon described the several mechanisms by which corrosion may occur, with special emphasis on galvanic corrosion which occurs when two unlike metals are exposed to an aggressive water or atmosphere.

Floor discussion centered around the common use of aluminum fins on copper tubes. **(A thorough examination of this specific subject will be made in a coming Technical Center in the NEWS.)**

"In boilers, proper pH (acidity/alkalinity) control is important to offer both corrosion and scale control," he continued. "Most popular corrosion inhibitors are based on either chromates or nitrites, although waste practices with chromates pose a problem because of their poisonous nature."

Nitrates form colorless, less toxic solutions which are ideal for the protection of ferrous metals, Hodgdon claimed.

Thermal insulation can be an important factor in corrosion, pointed out C. E. Ernst, senior engineer, Industrial Insulations Div., Johns-Manville Sales Corp.

"Insulated cold water lines running in exposed shafts or crawl spaces can corrode under the insulation because the insulation gets water soaked and corrosive chemicals are leached from the insulation to attack the metal pipe.

(Concluded on next page)

For Unmatched Flexibility

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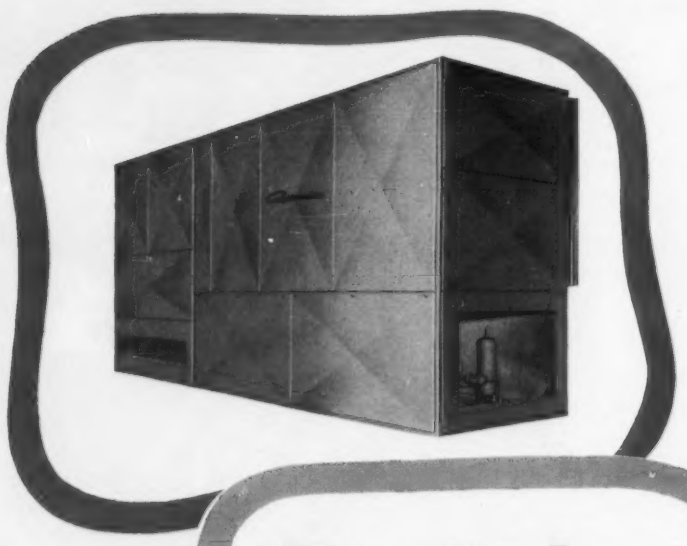
Central Station

Packaged Air Conditioning



7½-60 h.p.
water-cooled
or
evaporative condenser

Water-cooled or evaporative condenser models in nine sizes from 7½ to 60 h.p. provide a selection from which a combination can be arranged to fit any particular situation. Each model is available in different arrangements, matched to meet any space requirements.

All units are completely engineered and packaged—require only power, ductwork and water supply connections for quick installation. And, all are factory pre-tested to minimize performance testing time.

Write today for Form AC-1001 describing the new Capitolaire Central Station *Packaged* Air Conditioning System, or contact your nearest National-U.S. representative. He'll be glad to help you.

National-U.S. Radiator
CORPORATION
HEATING AND AIR CONDITIONING DIVISION
Johnstown, Pennsylvania
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Sixty years in thermal hydronics

100% MORE VARIETY

...plus 45% greater capacity than conventional models

A PLACE TO PUT MORE FROZEN-FOOD VARIETIES was the problem presented to Warren by retailers everywhere, and 76 years of experience and research paid off again — with the space-saving, big-capacity **Twin-Isle* Merchandiser,** now in use by leading operators all over this country. The Twin-Isle offers two-side shopping from two compartments—both in plain view yet one refrigerator — holds 2,644 frozen-food packs or 2,160 pints of ice cream, and is only 58" wide over-all. Offers twice the variety of a conventional low-temperature display case!

Lower total investment in cases themselves, less horsepower per cubic foot, installation costs cut in half, and a drastic reduction in cost of operation!

*Patent Pending

Warren Refrigerators BOX 1426 • ATLANTA 1, GEORGIA
EXPORT DIVISION: P. O. BOX 27284, LOS ANGELES, CAL.

Water Treatment, Chemical Cleaning--

(Concluded from preceding page)

"At times, even though the general insulation is properly applied and vapor sealed, fitting insulation is improperly sealed, or is applied in wet form only to cause difficulty later."

Organic protective coatings may deteriorate, forming ammonia which will attack the metals, Ernst warned, although he assured the audience that the total number of serious corrosion problems due to insulation is extremely small.

He cited an example where copper wire was used to tie on aluminum jackets. After the insulation was applied, the points of contact between the copper wire and aluminum jacket were corroded, while the remainder of the aluminum jacket was practically unaffected.

How To Reduce Occurrence Of Pipe Corrosion

To reduce the occurrence of pipe corrosion, Ernst recommended:

1. Keep metal dry.
2. Coat the metals with properly applied insulation.
3. Use cathodic or anodic protection where necessary.
4. Use chemical inhibitors where called for.

Hot water and anti-freeze systems using glycols were described by L. D. Polderman, assistant product sales manager, Union Carbide Chemicals Co., who stressed that "although new glycols are less corrosive than water, they do degrade with use, especially at high temperatures, and periodic checks on the systems are needed to prevent the degradation from getting out of hand."

Heat and oxidation are the two most important factors in glycol decomposition, stated Polderman. The initial thermal decomposition occurs at 329° F.; even here, the rate of decomposition is very slow and is not generally a problem in heat transfer systems, so long as oxygen is kept from the system. In practice, a usable maximum temperature of 320° is recommended.

Use of Inhibited Glycols Advised

"When oxygen is in the system, however, decomposition of glycols is more rapid and forms acidic products. With a system fully aerated, breakdown can occur at 150-175°. Anti-oxidants are used in some cases to prevent or slow this breakdown.

"Where several years life is desired, use inhibited glycols," Polderman advised. "This in no way contradicts the usual advice to discard automotive anti-freeze solutions at the end of a season, since in this case we are only speaking of a couple gallons of material."

And even well-maintained, frequently-tested glycol heat transfer fluids will have to be discarded and replaced in time, he concluded.

In reply to a question, Polderman warned against the use of stop-leak compounds in hydronic systems unless a real emergency exists.

Such components tend to deteriorate pumps, stuffing boxes, and seals, he further explained.

Andrews cited chlorination as the answer to corrosion caused by iron consuming bacteria, a common problem in many well-supplied water systems. Lime stabilization may be needed after chlorination, he pointed out.

WHAT . . WHEN . . WHERE

—A Guide to Coming Events of Interest

National Association of Frozen Food Packers Convention
March 1-4, Conrad Hilton hotel, Chicago.

Gas Appliance Manufacturers Association
April 1-3, Americana hotel, Bal Harbour, Fla.

Edison Electric Institute
April 5-9, New Orleans.

Oil-Heat Institute of America
April 29-May 4, Seattle.

Air-Conditioning & Refrigeration Institute
May 3-6, The Homestead, Hot Springs, Va.

Industrial Heating Equipment Association Meeting
May 17-20, The Homestead, Hot Springs, Va.

American Society of Heating, Refrigerating & Air Conditioning Engineers
June 22-24, Lake Placid Club, Lake Placid, N. Y.

"Corrosion." By Frank J. Versagi—50¢ each.

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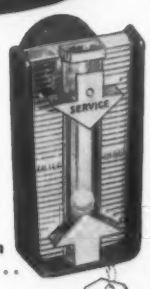

tells exactly when to change filters . . .
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Individually packaged with display/merchandising counter sales carton. A foolproof filter gage that really works sold on a satisfaction or money-back guarantee. Write for free sample and discounts.

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P. O. BOX 373 AC MICHIGAN CITY, INDIANA

THE PEOPLE WHO KNOW REFRIGERATION BEST

DEPEND ON THE PEOPLE WHO KNOW TUBING BEST!

HE'S BENT ON SOLVING YOUR TUBING PROBLEMS!

Your tubing's always in perfect shape with Ralph Iorio on the job. He's the Supervisor of Tube Process Engineering for GM Steel Tubing. His job is to find the fastest, most economical way of forming GM Steel Tubing to fit your specifications. Many times he can save you time and money by adapting existing high-speed forming equipment to do the job. Whatever your requirements, you can bet Ralph will find a solution. And you'll be assured of GM Steel Tubing that's quality-controlled to many times your specifications. Put some on test today. You'll see why GM Steel Tubing is ahead in refrigeration sales . . . by miles. *Rochester Products Division of General Motors Corporation, Rochester, New York.*

SEE SWEET'S CATALOG 1a/Ro

GM STEEL TUBING BY ROCHESTER PRODUCTS

AMERICA'S LARGEST MANUFACTURER OF REFRIGERATION TUBING

NWAHACA President Urges Dealers To Stimulate Consumer Desire for Quality, Sell Performance

CHICAGO — The nation's heating and cooling dealers were urged recently to take a "positive attitude toward the wants of the consumer and sell the performance, educate him to want and stimulate his desire for quality."

Declaring that during 1959 the American homeowner and home-buyer will be "far more interested in quality of the household durables he buys than the cost," Tom Byrd, president of the National Warm Air Heating & Air Conditioning Association, made these observations in his first principal statement as new head of the organization.

Byrd pointed out that "a dramatic change in attitude is developing very fast by the consumer toward his home purchases and is already reflected in the selling methods of the appliance industry."

Byrd continued: "The average consumer is more interested today in an automobile, Hi-Fi set, TV set, trip to Europe, outboard motor boats than a heating or air conditioning system.

Heating System Bought Because Buyer 'Has To'

"The reason is phenomenonly simple. He has been educated to want all of these things. But, he only buys a heating system when he has to, either as a result of having to put heating in a new house or replace a burned out furnace in an old one.

"We recognize that when a person has to do something, not only doesn't he enjoy it, but he tries to do it with as little personal inconvenience as possible, particularly as far as his pocketbook is cncerned."

Byrd said the NWAHACA has "adopted an attitude that something has to be done, collectively, to improve the buying public's failure to seek quality in indoor ducted heating and cooling systems.

"For as long as we permit the consumer's attitude to remain passive or even negative about the things we have to sell him, while it continues active and interested in the things other industries have to sell—our industry's low-price and low-profit problems will continue unabated."

Byrd, who is the president of Lau Blower Co., addressed the opening session of the Association's 1959 College Short Course program at the Illinois Institute of Technology here.

He stressed use of the association's manuals that are based on 41 years of research at the University of Illinois. These manuals, he pointed out, are used throughout every one of the 49 states and most foreign countries.

Voicing a hope that 1959 will be a profitable and good year for the over 30,000 dealer-contractors throughout the nation, Byrd nevertheless warned that 1959 could be "one of the roughest, most troublesome, one of the most frustrating years you've ever experienced."

He explained that it is relatively "easy to make the mistake in reading the forecasts and interpreting them as indicating that this year will be a 'good' or 'bad' year. But it does not necessarily mean that this is how the year will turn out for you. It's what we individually determine within ourselves to do during the year that counts."

Recently, appliance dealers throughout the nation were quated as saying that during this year they will be "emphasizing such conveniences as swinging out shelves, multicycles, and such with little talk about price."

"These hard hitting dealers, in perhaps the most competitive business in the country, are uping their advertising on quality, are going to stress performance and play down the cost of the item," he went on.

Price Advertising Has Confused Public

"One dealer said that the 'flood of price advertising in recent years has only made consumers confused and suspicious' From our experience we have found that these appliance dealers are the most sensitive group of merchandisers in the U. S. This shift in sales approach by them indicates that the public wants performance and quality," Byrd explained.

In a frank and forthright declaration, Byrd had this to say to all segments of the heating and cooling industry:

"If you've got enough respect for yourself, for your business, for your reputation as a legitimate dealer, and for your know-how, you will want to be identified with high quality work.

"Finally, you'll not only be able, but proud to design and install a legitimate job, creating customer comfort. As a result you will have a right to expect a legitimate price for your work and materials—and a legitimate profit for your pains in turning out this type of a job.

"This is the attitude of progress and advancement that will enhance you, expand your business, and give your customers trustworthy assurance that they have bought the best."

Mineral Wool Group Appoints Miller

NEW YORK CITY—Appointment of Myron D. Miller as secretary of the National Mineral Wool Association has been announced.

Miller has served for more than four years as secretary of two sections of the National Electrical Manufacturers Association, the Wire and Cable Section and the Electric House Heating Equipment Section.

In his new position as the head of the NMWA staff, he succeeds William A. O'Hara, who will continue with the insulation manufacturers' group in an advisory capacity.

Before joining NEMA in 1954, Miller was executive secretary of the Refrigeration Industry Safety Advisory Committee.

For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

Only 25¢ each.

Cooling Computing Machine

Combination Ceiling Light Fixture, Air Diffuser Eases Heat Problem

HARTFORD, Conn. — A new combination ceiling light fixture and air diffuser has helped to solve an unusual heat problem created by a mammoth installation of electronic computing machines at the home offices of The Travelers Insurance Co. located here, it was announced recently.

Planning to install an RCA "Bizmac" data processing system in the company's statistical department last August, engineers sought an air cooling method to offset the heat from more than 20,000 electronic tubes contained in the units, and still retain the modern, clean-lined appearance of the drop ceilings of the insurance firm's building.

It was decided to use the new "Multi-Vent Troffer"—a flush-mounted fluorescent lighting fixture that hides a low velocity air diffuser, attached immediately above.

Designed and developed by the Multi-Vent Div. of The Pyle-National Co., Chicago, the Multi-Vent Troffer maintains a vertical, low-speed air flow through tiny slots in the light fixture.

The lighting component in the unit was manufactured by Benjamin Electric Mfg. Co., Des Plaines, Ill., a licensee of Pyle-National.

Moving Van Trailer Is 35 Ft. Long

Construction Shanties on Wheels Save Mechanical Contractor Labor, Expense

NEW YORK CITY—Construction shanties on wheels, fully stocked with virtually every standard type of heating and air conditioning pipe and fitting, have replaced the traditional wooden shack in the on-the-job operation of one mechanical contractor.

The modern day shanties, equipped with 300 to 400 fitting bins, pipe racks, welding generators, and pipe cutting and threading tools, are actually 35-ft.-long trailers which can easily be moved from job to job with a minimum of labor and expense.

According to Frank Hudik, president of Hudik-Ross, Inc., the mechanical contracting firm which has already purchased three trailers and plans to acquire two more, the use of the trailers has resulted in considerable cash savings as well as increased working efficiency.

Until recently, Hudik-Ross used the traditional wooden shanty. These had to be assembled at each job site and stocked with materials and equipment. Upon completion of the project, the shanty had to be completely cleaned out, dismantled, and carted to the next job where the cycle was started again.

In addition to the fact that the labor involved in assembling, disassembling, and reassembling the shacks was time consuming and costly, the area within the shanties for stocking and for office space was generally insufficient.

As an experiment, Hudik-Ross purchased a trailer to be used as a mobile shanty. It was an immediate success.

Just two factors, the elimination of the assembling and disassembling cycle and the ability to store material and equipment without having to remove it and rehandle it in every new location, paid for the trailer in a short time, the company said. A second and third trailer were acquired in short order.

The fact that workmen have a ready stock available to them at all time results in additional economies.

The company has found that the moving van trailer is preferable to the regular semi-trailer for two reasons. For one thing, the moving van is 8 ft. high on the inside as opposed to about 6½ ft. for the regular semi-trailer. Furthermore, the moving van also provides side access.

The trailers are about 35 ft. long and 8 ft. wide, allowing sufficient storage space for materials delivered to the job, as well as office and shop space.

When a job is completed, a tractor hauls the fully-stocked trailer to the next project. The cost of moving a trailer from one location to another ranges between $25 and $50. By comparison, the cost of dismantling a shanty and erecting it anew is approximatley $250, it was noted.

Hudik-Ross takes advantage of the trailers' large exterior surfaces, using that space to promote its name and field of operation. The company name is painted across the length and on the rear of the trailer in letters 2 ft. high, advertising which reportedly has already resulted in several responses from potential customers.

The most important man in this meeting is not present

That's not double talk; it's *straight* talk about the status of Lennox dealers in a Lennox management meeting.

Around this table, policy decisions are made. And dominating every meeting is the conviction that you, the dealer, are "Lennox"—as far as the public is concerned. An awareness of your importance—and our mutual dependence—affects every product, sales and marketing decision.

You see, the main business of Lennox is heating and air conditioning. It is not subordinate to a parade of diverse products foreign to the indoor comfort business. We have no sidelines; your business is *our* bread and butter, too.

For that very good and practical reason, your interests are protected. That's why—although you're not there in person—your "vote" decides every issue.

Wouldn't *you* like to be on this kind of a team? Write or phone your nearest Lennox factory for the full story—without obligation.

LENNOX Industries Inc.

Established 1895

Marshalltown, Iowa • Columbus, Ohio • Syracuse, N. Y.
Fort Worth, Texas • Salt Lake City, Utah • Decatur, Ga.
Los Angeles, Calif. • Des Moines, Iowa

Lennox Industries (Canada) Ltd.
Toronto, Montreal, Calgary and Vancouver

Elliot Godes Says

High-Velocity Duct System Must Be Simple, Complete, Flexible

CLEVELAND—Simple! Complete! Flexible!

These three points were stressed by Elliot Godes, Anemostat Corp., as "must" design requirements for any successful high-velocity duct system.

He spoke at the first combined meeting of the Cleveland Chapters of American Society of Refrigerating Engineers and American Society of Heating & Air-Conditioning Engineers.

Godes pointed out that due to the vast acceptance of high-velocity air distribution as a practical and economical system, it is important that an engineer learn all he can about this type of system. If he fails to do this he will be caught using yesterday's tools in today's market, Godes explained further.

An expert on fluid flow as it applies to high velocity design, Godes authored the manual, "High Velocity Duct Design." This manual has been adopted by several consulting engineering companies as standard procedure.

Soviet Commercial Counselor Says

American Firms Seeking Rights on Russian Thermoelectric Generators

SAN FRANCISCO — Accompanying Russian goodwill-touring vice-premier Anastas Mikoyan, the commercial counselor for the Soviet Union in Washington revealed here that several large American companies are attempting to obtain licensing and manufacturing rights on Soviet-perfected thermoelectric generators.

Vladimir S. Alkhimov refused to name the companies, stating simply, "I do not feel it necessary to identify the firm." But the commercial counselor did say that some negotiations are already in progress.

As discussed recently in "Introduction to Thermoelectric Refrigeration" (NEWS, Nov. 24, '58), the Russians are admittedly ahead of this country in basic knowledge and application of thermoelectric devices.

Thermoelectric generators, as such, preclude the necessity for transforming, rectifying, and filtering normal power supply now necessary to make thermoelectric refrigerators and other devices usable.

SNAP III, the 5-lb. thermoelectric generator recently presented to President Eisenhower, uses semiconductor thermoelements with atomic energy as the heat source, but its estimated cost is thousands of dollars—making it presently impractical for general use, it was pointed out.

U.S. Joins International Standard's Program for Refrigeration Industry

NEW YORK CITY—A new, extensive program of international standardization in the field of refrigeration, with U. S. participation, has been launched.

According to a report from the American Standards Association, Technical Committee 86—Refrigeration—of the International Organization for Standardization (ISO), at a meeting in London, England last September, established its objectives and organized one working group and six subcommittees to carry out the work.

The United States has accepted the administrative secretariat for Working Group 1—Designation of Refrigerants, and of Subcommittee 6—Testing of Factory-Assembled Air Conditioning Units.

The other subcommittees formed are: 1—Safety (Secretariat, Germany); 2—Terminology, Definitions and Symbols (Italy); 3—Testing of Refrigerating Systems (Belgium); 4—Testing of Refrigerant Compressors (United Kingdom); and 5—Construction and Testing of Household Refrigerators (France).

American participation in the work of the International Organization for Standardization is arranged through the American Standards Association, as the U. S. member of the ISO, and it accredits the delegates to ISO meetings.

An advisory committee to the American Standards Association on the subject of ISO Technical Committee 86 will be formed from the United States National Committee to the International Institute of Refrigeration (IIR).

IIR has an active program dealing with purely technical, non-commercial aspects of refrigeration. The work of the ISO Technical Committee 86, on the other hand, will be concerned with standards that will facilitate international commercial use of refrigerating equipment.

German Charges That Most U. S. Motors Nominally Overrated

COLOGNE, Germany—"Nominal motor-compressor outputs indicated by American manufacturers are reached at such low vaporization temperatures that the motors are nominally overloaded in most applications," charged one German authority during a presentation at the meeting of Committee III, International Institute of Refrigeration.

German refrigeration industry must adjust to this practice to remain competitive, he suggested, until the adoption of international regulations concerning ratings.

International Testing Code Prepared for Refrigerators

PARIS, France — "Recommendations for an International Testing Code for Refrigerating Machines" have been prepared and translated into English by Commission III of the International Institute of Refrigeration here.

Methods are proposed for determining "over-all refrigerating effect, net refrigerating effect, useful refrigerating effect" of a unit, and details are specified for testing either a complete system or a compressor alone. Conversion tables give factors for all English-Metric transitions.

English translation of the recommended code is available for 50 cents from International Institute of Refrigeration, 177 Boulevard Malesherbes, Paris 17, France.

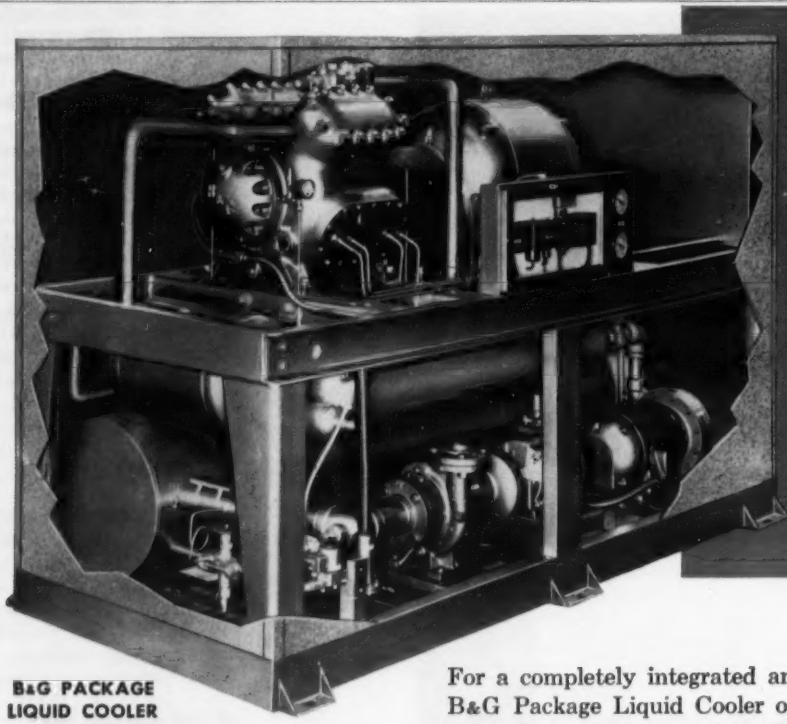
India Going Metric

CALCUTTA, India — With political independence from England already achieved, India has begun throwing off the admittedly cumbersome English system of measurement in favor of the metric system.

Government officials are circulating through the country discussing the change with State officials. From January '58, all contracts, purchase orders, etc., will have quantities and prices expressed in metric units.

Kilometer stones are being set up on all roads, on the opposite side from existing mile and furlong markers. Maximum safe loads on bridges will be expressed in both metric and long tons.

Scientific, technical, statistical publications of the government will henceforth use metric units, supply equivalents where necessary.



A WELL DESIGNED, COMPACT MACHINE WITH ALL MAJOR COMPONENTS COVERED BY ONE MANUFACTURER'S GUARANTEE!

B&G PACKAGE LIQUID COOLER

For a completely integrated and assembled water chiller, the B&G Package Liquid Cooler offers many outstanding advantages. It is equipped with B&G products throughout—the only unit of its kind *with all major components designed, built and guaranteed by one manufacturer!* This packaged unit eliminates many costs which might otherwise be charged against the job.

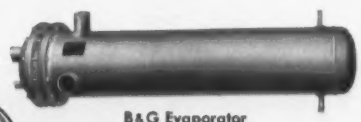
In capacities from 7½ through 150 tons, the matched components of the B&G Package Liquid Cooler give a complete capacity-engineered combination of chassis, motor, compressor and automatic control obtainable nowhere else. Everything included—no extras to buy.

B&G CONDENSING UNIT
Cut-away shows construction of compressor

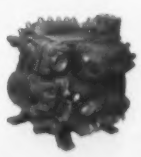
B&G CONDENSING UNIT
Here is another matched unit with all components manufactured and guaranteed by Bell & Gossett. It offers an impressive list of features, *many of them exclusive*, which make it completely outstanding. Amazingly compact as well as efficient—7½ through 150 tons.

A FULL LINE OF REFRIGERATION AND AIR CONDITIONING COMPONENTS

B&G Condenser



B&G Evaporator



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500 Low Priced Homes To Get Carrier Air Conditioning

SYRACUSE, N. Y.—A half million dollar contract to air condition 500 "low priced" homes in the Dallas area with a year-round system is announced jointly by Carrier Corp. and Fox & Jacobs Construction Co., said to be one of the nation's foremost builders of air conditioned homes.

Russell Gray, Carrier vice president and general manager of the Unitary Equipment Div., said the order is the largest so far for the new "Thermo-Center" — an inside furnace joined through the wall to an outside cooling unit.

David Fox and Ike Jacobs credit the savings on first cost installation and operation as the basis for providing year-round air conditioning in their $13,950 homes.

In the past three years the Fox & Jacobs building team has constructed more air conditioned homes than any other Dallas builder, according to the announcement.

"On completion of the new project, they will have erected more than 1,000," it was stated. "The total for the state of Texas is 92,000 centrally air conditioned homes.

"Public interest in the latest air conditioned development is evidenced by the 300 homes sold before ground was broken. Fox and Jacobs attribute this to the importance they have placed on customer relationships and on reduced costs for quality homes through construction efficiency."

The 500-unit order was negotiated by Robert F. Frymire, president of Frymire Engineering Co., Carrier dealer in Dallas, who also is responsible for the application design of the new system.

Chattanooga Gas Sells 71 Gas Cooling Units In Heart of TVA Area

CHATTANOOGA, Tenn. — Chattanooga Gas Co. sold 71 Arkla-Servel gas air conditioning units plus two 25-ton liquid chillers in the heart of TVA country during the past year, E. F. Davis, general sales manager, reported recently.

In 1957, the company's first year selling gas air conditioning, the utility sold 22 units.

"Our plans for the coming year," Davis said, "call for the sale of at least 150 Sun Valley units—or about seven times our 1957 sales—with a stronger emphasis on large-tonnage equipment."

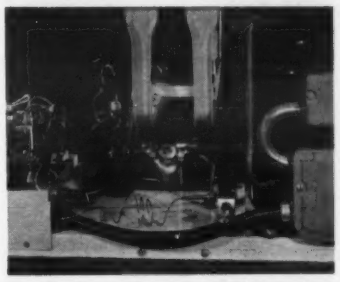
Davis pointed out that his firm's sales record is accomplished in a territory where the gas air conditioning rate is about 35% higher than the electric rate and where domestic users consume more electricity than anywhere else in the world.

"Thus far," he said, "we have succeeded in making installations in homes ranging in price from $18,000 to $150,000 (22 in one project), as well as in dental clinics, restaurants, real estate offices, supply houses, churches, and other various locations.

Coleman Change Points Up Need For Proper Drying of Remote Systems

WICHITA, Kan. — Necessity of proper evacuation and drying of remote residential air conditioning systems (or any system, for that matter) is pointed up in a recent design change made by the Coleman Co., Inc. here.

Although the company had long recommended that its dealers install a sight glass and drier unit, this was not always done, according to Frank Osborn, chief air conditioning engineer. As a result, moisture in the system was a recurring problem under certain conditions.



BY including sight glass, moisture indicator, and drier combination (center of photo) in its remote residential condensing unit, Coleman is assured system will be properly evacuated and dried in the field.

To make sure that proper precautions are taken, Coleman now incorporates a combination sight glass, moisture indicator, and drier in the condensing unit section of its "Polar-Prince" residential air conditioners.

Device used is the Ansul "Super Dry-Eye" with "T-Flo" drier.

Coleman practice now is to ship the condensing unit with the sight glass and moisture indicator installed in the lines but capped. The drier cartridge which goes with it is capped in its original factory carton.

When the installer is ready to charge the unit, he breaks the seals on the Dry-Eye and the cartridge just before installing the drier. This insures the drier being fresh right up to the time the unit is charged.

If the indicating elements in the moisture indicator are pink before the system is evacuated, the installer knows that the refrigerant lines are wet. During evacuation and before charging, the color of the Refrigerant-12 indicating element should turn blue. If it does not turn blue, there is either a leak in the system or the evacuation procedure is faulty.

After the system has been properly evacuated, the drier installed, and refrigerant added, the Refrigerant-22 element should turn green. If it hasn't turned green within 24 hours, the system is still wet, so a new drier should be installed.

Water Treatment Contract Let for Apartment Group

NEW YORK CITY — A contract to treat the water in the air conditioning systems, heating systems, and boilers of the 970-suite Park Towne Place Apartments in Philadelphia has been awarded to Water Service Laboratories, Inc.

The apartment group, said to be the largest of its kind in Philadelphia, comprises four 18-story buildings and includes a shopping center, a restaurant, and a swimming pool. Each building will be fully air conditioned.

Just completed . . . a spanking-new plant at Institute, West Virginia, built by Union Carbide Chemicals Company to supply 50 million pounds of fluorocarbons a year! That means new UCON Refrigerants are available now . . . bringing you *all* the advantages of the nation's newest refrigerants. You'll get . . .

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UCON Refrigerant 12 Dichlorodifluoromethane
UCON Refrigerant 22 Monochlorodifluoromethane
UCON Refrigerant 113 Trichlorotrifluoroethane
UCON Refrigerant 114 Dichlorotetrafluoroethane

UNION CARBIDE CHEMICALS COMPANY *Division of Union Carbide Corporation*

Inside Dope

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1)

Air conditioning came to the rescue.

It used to be that John L. Lewis was the most militant, hated, and feared union leader in the country. Annually his coal miners went on strike, and crippled the nation—sometimes for months.

They haven't been heard from lately in that regard. No strikes for several years. Peaceful bargaining. High wage rates. Prosperity for the operators.

Wha hoppen?

During the years of Lewis's most formidable belligerency, coal was suffering from declining markets. Two of its three biggest (in the aggregate) customers—railroads and homes—were abandoning use of coal.

Railroads switched from steam to diesel-oil locomotives. Home heat converted from coal to oil and gas.

Third best customer (electric utilities) however, subsequently gained a new lease on life through air conditioning. Why?

Because the tremendous growth of air conditioning gave electric utilities a *summer* peak load—which they never had enjoyed before.

Result: coal miners work all the year-round now. They're happy, Lewis is happy, and so are the operators. Nobody is mad at anybody; and the most turbulent union has become the most peaceful.

All hail air conditioning!

Romney's Right

President George Romney is much in the news these weeks, and with good reason. He makes it—both by what he does and what he says. Here are some pungent paragraphs from a speech we heard him deliver to the Adcraft Club of Detroit:

"If Americans are to express themselves intelligently about our economic system, they must know more about it. How can they know more about it unless those engaged in it will speak out more fully about the economic facts of life as we experience them?

"My personal conviction is that one in a position of business leadership should not excuse himself, for reasons of inconvenience, business pressures, personal obligation or corporate relationships, from speaking out publicly on vital problems that require wider public understanding.

"Unless those qualified by experience and first-hand observation of problems do speak up, how can the public generally have the necessary facts on which to make intelligent decisions?

"Unfortunately, there is too much self-imposed silence from business leaders on controversial matters. Unless the informed make it their duty to share their information, the opportunities for social progress will be limited.

"While our country was established on sound spiritual, human, political and economic concepts, we are only in the very early stages of realizing the full potentials of these concepts. It took many centuries to establish the principle of religious liberty. We have been working since the founding of the Republic at the problem of establishing political freedom in this country for all our citizens, yet we still have millions not privileged to vote.

"Our application of the principles of freedom to modern industrialism is only in its beginning stages. America's industrial development, after all, is an event of the last 70 or 80 years. It will probably take much longer to perfect the economic principles that will permit every willing American the opportunity to achieve economic self-realization, than to complete our establishment of political freedom.

"We are moving in the direction of governmental control resulting from a lack of confidence in the adequacy of competitive discipline. Such central control and regulation is the brute strength of communism. It is not the superior strength by which America has achieved the highest known degree of human well-being and material abundance.

"We stress the element of human well-being and self-realization ahead of our material abundance because in shaping our national policies and programs we must give priority to the opportunity for individual expression and growth if we are to realize the greatest results in a material way. The two are interlinked.

"Carl Sandburg once said: 'If America forgets where she came from, if people lose sight of what brought them along, if she listens to the deniers and mockers then will begin the rot and dissolution.' The deniers and mockers who are already here and well organized cannot be eliminated by silence or conformity.

"It is not just what we are capable of accomplishing and producing that is in jeopardy; it is what we have *already* accomplished and produced. The inherent nature of our task is indicated by the great truth voiced by Thornton Wilder when he wrote: 'Every good and excellent thing stands moment by moment on the razor edge of danger and must be fought for.'

"The magnitude of our past success in America, though it confronts us with problems of a most fundamental nature, has also opened the door for unlimited accomplishment. Our frontier is as broad as knowledge and space and the unlimited capacity of human beings.

"It is world wide. We need a space age outlook. We need modern pioneers and non-conformists who cannot be deterred by material plenty, political ambition, or social diversions."

Space Travel Note

Now that outer-space travel seems assured, we have good news for the first man to land on the Moon or Venus. (Defense Secretary McElroy has revealed that 120 men are in competitive training for this exploit.)

A Paris correspondent informs us that 'way back in 1889 a wealthy Frenchwoman, Mme. Anna Guzman, bequeathed a large sum to the "person who first succeeds in reaching any heavenly body, excepting the planet Mars."

With accumulated compound interest, this legacy will be a real whopper. Although "Dope" isn't on McElroy's list, he's interested—in case the selected spaceman chickens out. And (interested) not just for the legacy, either.

"Clammy Cool" is for seafood-*not people!*

Frigidaire advanced dry-cooling

offers new business conditioning sales possibilities

In '59, and the years to come, more and more business firms will think first of Frigidaire Air Conditioning. Why? Because Frigidaire has built a *big new difference* into air conditioning requirements—Dry-Cooling! Now, Frigidaire offers you perfectly balanced cooling and dehumidification in a complete line of air and water-cooled units and components. Now, you can install *true* air conditioned comfort, "cooling without clamminess", to please the most demanding of prospects. This is air conditioning designed for *people!*

More sales possibilities? You bet! Your best prospects will be pre-told about Frigidaire's advanced concept in business conditioning by provocative advertising in big-circulation business publications. And—you can bid profitably on more installations, thanks to full Frigidaire flexibility.

Learn more about Frigidaire Dry-Cooling. Call your Frigidaire Distributing Headquarters or write Frigidaire Division, General Motors Corp., Dayton 1, Ohio, for fact-crammed literature and sales programs designed with you in mind.

Here's what we mean by FRIGIDAIRE FLEXIBILITY!

Trans-Wall Units with new furnaces
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Coil-Blower Units hung from the ceiling
Cooling Coils with furnace or duct
Master-Matic Units on the floor

PLUS eleven Room Air Conditioner models and a complete line of furnaces.

designed with your business in mind Frigidaire Dry-Cooling...

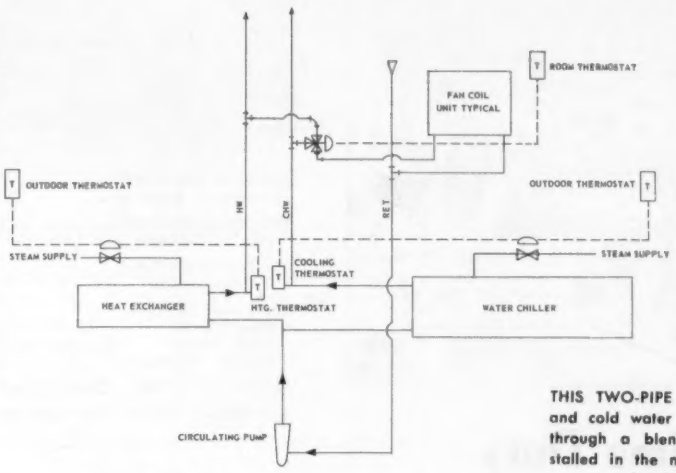
GM FRIGIDAIRE Backed by General Motors

cools, cleans, and dries the air!

Engineer Surprises Self—Saves Money On Two-Pipe Heating, Cooling System

LANSING, Mich.—A modified two-pipe cooling and heating system that will permit the use of a single-acting thermostat instead of separate heating and cooling thermostats will be installed in the Lansing Medical-Dental building now under construction here.

E. Roger Hewitt, consulting engineer, declared that though he expected this system to cost more than the usual single-pipe system with double-acting thermostats, it will actually cost several thousand dollars less. Cost of additional piping is more than offset by the saving in controls, he said.



THIS TWO-PIPE system of supplying hot and cold water to room air conditioners through a blending valve is being installed in the new Medical-Dental building in Lansing, Mich.

Fan Coil In Every Room

The L-shaped, two-level clinic, measuring 60 by 205 ft. on one wing and 60 by 124 ft. on the other, will accommodate 32 doctors and dentists. There will be a fan-coil unit in every room of the building, whether interior or exterior. This is unusual for clinics, Hewitt believes.

Fifty-six perimeter units line the walls of the lower level and 73 are installed on the upper level. Each supplies its own fresh air.

On the lower level, 46 units recirculate air in interior rooms. On the upper level, 65 units perform the same chore. A ceiling-mounted 5-ton unit on the lower level supplies fresh air for corridors.

At the heart of the system are a 100-ton Carrier steam absorption water chiller and a Johnston 100-hp. gas-fired boiler. A 400-g.p.m. Marley cooling tower cools condensing water.

How It Works

Under Hewitt's system, both boiler and water chiller are controlled by separate indoor-outdoor thermostats. The chiller circulates 45° to 50° F. water and the boiler 90° to 140° F. water around the building in separate pipes. Take-offs from each of these pipes feed into a three-way pneumatic blending valve at each room unit. A single pipe runs from the blending valve, through the room unit, and then to a single return line.

A single acting pneumatic thermostat governs the operation of the blending valve. When temperature rises above the comfort level, thermostat will close off the hot water line and allow chilled water to flow through the room unit.

As temperature drops, the blending valve permits a blend of chilled and hot water to maintain a comfort level. If temperature continues to fall, flow of chilled water is cut off entirely and only hot water circulates through the unit.

Can Heat, Cool At Same Time

"With this system," Hewitt declared, "we expect to be able to provide comfortable temperatures even during those 'in-between' days when some areas of the building may be calling for heating while others demand cooling."

After passing through the circulating pump, return water flows to both boiler and chiller.

At times when both chilled and hot water are fed into return line, there will be a greater than normal water temperature differential at both the boiler and chiller, Hewitt expects. However, he does not anticipate any significant effect on the operation of the system.

Mayotte & Webb of Lansing is architect for the structure, which should be completed next fall. James A. Dort Co. of Mason, Mich., is the mechanical contractor.

Arthur Edwards Dies

CINCINNATI — Arthur Edwards, manufacturers' representative and former Trane Co. representative here, died while on a return trip from the International Heating and Air Conditioning Exposition in Philadelphia.

Edwards had been at one time a member of the ASHAE council and prominent in the society's affairs.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

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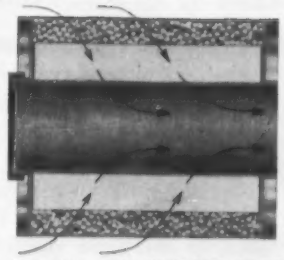
875-CMS DRI-COR® Filter-Drier Cartridges for these new driers are self-sealing and self-positioning. It requires only a few seconds to insert the cartridges into the drier shell, resulting in a minimum of exposure to the atmosphere and loss of cartridge drying capacity. Thus, the cartridges are clean, dry and complete—due to efficient design and split second handling.

The refrigerant flows uniformly over the total cartridge surface, through the desiccant bed and each filter core. This results in maximum moisture and acid removal with high flow capacity and low pressure drop.

These brass driers contain from two to five cartridges and are available with connection sizes ranging from 1⅛" to 2⅛" O.D. Solder.



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by

Jimmy Hatlo

I KNEW YOU'D GET THE JOB, HEWLINE--UH-- I'M THE GUY WHO TOLD THE BOSS YOU WERE THE ONE MAN FOR THE JOB--HE CALLS ME IN AND SEZ, "I'M CONSIDERING FOUR GUYS FOR V.P." SO RIGHT AWAY I SEZ----
HE'S THE GUY--HE TOLD BEN FRANKLIN TO FLY A KITE--HE TOLD MICKEY MANTLE TO SWITCH HIT--THE BOSS DON'T HICCUP WITHOUT CONSULTING PHOOTKISS---
HE BETTER PUT IN A GOOD WORD FOR HIMSELF-- HE'S BEEN HANGIN' SINCE HE FINAGLED A JOB HERE---
HE'S A FRONT RUNNER--HE ALWAYS PICKS THE RIGHT HORSE AFTER THE RACE--
PHOOTY'S THE POWER BEHIND THE THRONE--TO HEAR HIM TELL IT--HE MUST WARN THE BOSS TO PLAY IT COZY--I NEVER SAW BIGDOME EVEN GRUNT AT HIM----
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LISTENING TO THE OFFICE POLITICIAN WAX UP THE BOY WHO MADE GOOD--- THANX AND A TIP OF THE HATLO HAT TO DICK MAGNELL, P.O. BOX 236, HADDONFIELD, N.J.
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Businessmen Have a Prime Duty —To Be Patriotic!

AMAZING! In a brief quarter of a century a Labor Party (in everything but name) has become a superbly organized, financially powerful, and politically influential group of voters in the U.S.A.

In itself this is remarkable. Yet, all signs indicate that this is only a start. Monopolistic unions have not been reluctant about predicting further upsurges in their program of taking over larger roles in running our local, state, and national governments.

How do labor politics affect you and me? It's horribly simple. They sponsor inflation.

When ever-upward higher wages outrun productivity, a worker is taking money for services he has not delivered. Thus a new element of cost is added to a product—a fictitious cost which represents no equivalent in value.

Obviously this results in higher prices and inflation. The latter, in turn, decimate and distort the savings, the purchasing power, the insurance, and the pensions of all Americans in all walks of life.

In this fiscal year we are faced with a Federal deficit of $12 billion dollars, which amounts to much more than all the taxes (Federal, state, and local) which were paid in any of the 1920's.

This deficit, moreover, might have been much worse had some of the make-work bills, sponsored by unioneers to combat a short-lived recession, been passed (or had not been vetoed by the President).

Well, then, shouldn't businessmen enter politics, just as the unions have? Are we to submit to inflation forever? Shouldn't we be *heard?*

A businessman entering the political scene has several assets. First, and most important of all, his interests are the legitimate interests of all good Americans—or should be. That is, he wants to maintain and strengthen freedom, he wants to preserve our private economy, and wants to *stabilize* it.

He is against inflation.

In addition, a businessman possesses other specific advantages in politics. He has the talents to do jobs which so greatly need doing. He has the know-how of organizing and selling. He is experienced in communication and human relations. All these are, after all, vital elements of politics.

A bulletin of the U. S. Chamber of Commerce declares:

"Politics is not only the art and science of government, it is primarily organization; and American businessmen have developed the world's most effective economy through superb organization.

"It is high time that we businessmen cease to be shrinking violets in the political field. We must learn to grow in this field as we have learned to grow in business. We are not now entirely politically alert. The opportunists among the politicians make capital of this lack of alertness.

"Because we have not sold the very great virtues of our free enterprise system to all the voting public, the politicians have decided we are an unpopular minority—and unfortunately they rally to the support of our detractors."

Professor Andrew Hacker of Cornell has stated recently that our democratic system itself is imperiled by a lack of political action on the part of businessmen. This is true at all levels of management.

Junior executives—who could be the very core of political leadership today—are inclined to avoid controversy, and to shy away from politics, for fear of offending their customers, their superiors, or colleagues.

Though many businessmen still cling to worn-out arguments that a company should not openly endorse any policy or any party, there are heartening indications here and there that business is becoming alive to the necessity of participating actively in politics.

"Business executives of this country have demonstrated their qualifications for leadership. Now it is time that they become fully aware of the impact of politics upon the operation of our free enterprise system," states a U. S. Chamber of Commerce bulletin.

Businessmen cannot stand aside saying "this is politics and we are businessmen, so we will let the politicians do it"—then disclaim all responsibility for the results.

Ergo: Let's all of us help select, nominate, and *elect* to local, state, and national offices people who believe sincerely in the principles of a sound economy.

Let us "stand up and be counted"—even though, by doing so, this may *temporarily* affect adversely some segment of our business.

Let us seek out and expose those anti-business candidates who try to take credit for the wonderful results flowing from our free enterprise system, while at the same time they are seeking to destroy it by advancing socialism.

Let us recognize what that indifference to politics on the part of business executives means:

More overpowering government; more government waste; more taxes; more deficit financing; more inflated prices; more exercise of authority by radical demagogues; more burdens and regulations that will handicap our services to the American people; more impairment to stability of our economy.

And endless inflation.

Let's get with it, men! Let's make politics our business!

To exert every possible effort to eliminate undemocratic practices and undemocratic attitudes, to do all that we can do to close the gap between our professions of democracy and our practice of it . . . is the only way that we can achieve our maximum national strength and unity and fully discharge our international responsibilities. In these critical times, this we must do. We cannot afford to do less.—RALPH J. BUNCHE.

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'The Conscience of the Industry'

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"A newspaper conducted on the true and natural principles of such a publication ought to be the register of the times, and faithful recorder of every species of intelligence. It ought not to be engrossed by any particular object, but, like a well-covered table, it should contain something suited to every palate."—*John Walker.*

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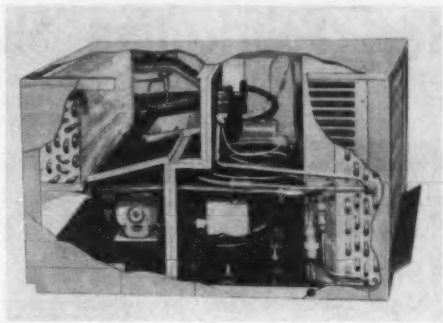
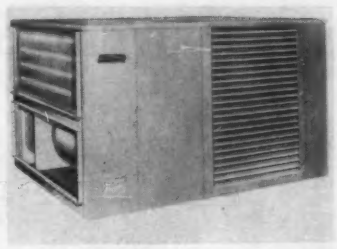


MUELLER Climatrol's new Type 925 summer air conditioner has two independent 2-hp. cooling cycles, one of which may be operated as conventional air conditioner or as a straight dehumidifier to provide dehumidification even when cooling is not needed.



MUELLER Climatrol air-to-air heat pump comes in 3 and 4-hp. models designated as Types 315-31 and 315-41.

1959 Mueller Climatrol Line--

(Concluded from page 1)

is needed in most areas of the country from two to four times as many hours a year as straight cooling.

The new unit, type 925, has two independent 2-hp. cooling cycles, one of which may be operated either as conventional air conditioning, or as a straight dehumidifier.

Operation of the unit is controlled by a humidistat as well as a thermostat, so that the homeowner can set the humidity conditions desired as well as temperature, and the humidity control air conditioner will maintain both. A special all-in-one control center is furnished with the 925.

3-Way Operation Handles Variety of Conditions

Through its three-way operation, state the Mueller executives, the unit can meet a wide variety of summer conditions. Typical examples cited were (1) warm weather, high humidity: 22,000 B.t.u. cooling with 5½ pints per hr. dehumidification. (2) Hot weather, high humidity: 42,000 B.t.u. cooling with 11½ pints per hr. (3) Mild or cool weather, high humidity: dehumidifying only 6 pints.

The dehumidification cycle uses a reheat coil placed in front of the regular cooling coil. Hot gases are passed from the compressor through this reheat coil.

Electric Humidifier

The new electric humidifier for furnace installation was described by R. B. Schmidt as capable of being installed in either the plenum or in the duct, upstream or downstream in the air flow. It will provide humidification at the rate of from 2 to 26 qts. per day.

This is accomplished with an 800-watt Nichrome electrical heating element immersed in the water pan. Evaporation may be controlled either by a dial setting on the unit, or with use of a humidistat mounted in the living area.

Water level is controlled by a counterbalanced reservoir pan activating a solenoid valve whenever water is needed. All controls are outside the heated area, so hard water deposits cannot affect their operation, it was stated.

A twin liner pan makes disposal of hard water deposits simple, since an inner pan of aluminum can be thrown away and replaced when deposits build up. The outer pan is made of stainless steel.

The 50-800 electric dehumidifier is readily installed in the plenum, branch or return air duct, it was stated, and is rustproofed and finished in a propophenolic resin baked enamel inside and out.

The models 315-31 and 315-41 air-to-air heat pumps are available with electric resistance heating to provide supplementary heat in areas where required. With these preassembled, packaged horizontal systems, by reversing the flow of refrigerant, the units supply cooled air in the summer and heated air in the winter through a single duct system or a louvered discharge plenum. Units are controlled with a single wall-mounted thermostat.

In its deluxe winter air conditioner model 105-1 (gas) and 202-1 (oil), the new features are described in the following manner:

The "Levelizer" variable input gas valve is designed to make continuous air circulation easy. A "weather wand" control outside the house varies the input of gas according to temperature.

A variable air flow blower, used in conjunction with the gas valve, adjusts the amount of air flow in accordance with varying gas input. This blower can be used to deliver the different air volumes needed for heating and cooling in a year-round air conditioner.

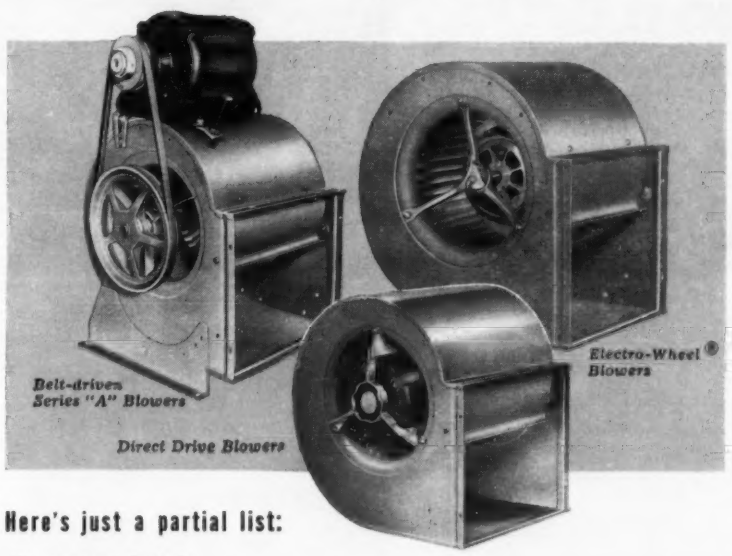
An electronic air cleaner is built in as an integral part of the blower compartment. Filter pads are cleanable and easily replaceable. When filters need cleaning or replacing, the homeowner is signaled by a red light right on the thermostat. A "filter flag" signal and reset butt is also mounted directly on the heating unit.

Other features listed included a tapered radiator section providing constant flue gas flow; dimpled radiator sides to give turbulent scrubbing action; cast-iron, individual raised and drilled port type gas burners; and thermo-acoustically insulated fan and heat exchanger compartments; large blowers and motors for quiet air circulation and adequate c.f.m. for cooling; adaptable for summer air conditioning system at time of installation, or later.

Looking for a Business to Buy . . . ?

Check the Business Opportunities Section in the classified advertising columns.

There are good reasons why these leaders look to LAU —



Here's just a partial list:

The American Coils Co.
Buck X-Ograph Company
Continental Manufacturing Co.
CUSTOM-AIRE PRODUCTS Div. Pacific Industries, Inc.
Empire Stove Company
Essick Manufacturing Company
Fraser & Johnston Co.
General Air Conditioning Corp.
Hall-Neal Furnace Company
Hayes Furnace Mfg. & Supply Company
Jackson & Blanc
Kleer Kleen Manufacturing Co.
Leeson Air Conditioning Corp.
Melchior, Armstrong, Dessau Co., Inc.
Penn Boiler & Burner Mfg. Corp.
Prat-Daniel Corporation
Remington Air Conditioning Div.
Temco, Inc.
Thermador Electrical Manufacturing Company
Therm-Air Manufacturing Co.
York-Shipley

THE BIG WHEEL in air moving

Engineering advances such as Preslok® construction and Electro-Wheel Blowers. Delivery—quick and sure. Competitive prices. Talk to any of our customers and you'll find they have good reasons for calling LAU to help them move air. Maybe that's why we've grown each year until we sell more blowers and components than any other manufacturer. And isn't that a pretty good reason for seeing LAU about your air moving problems? **LAU Blower Company,** 2027 Home Ave., Dayton 17, Ohio. OTHER PLANTS at Irwindale, Calif., and Kitchener, Ont.

Leaders look to these LAU Sales-Engineers for on-the-spot help . . .

Cincinnati 30, Ohio
Don G. Jensen
6422 Glade Avenue

Cleveland 24, Ohio
Charles C. Miley
1561 Woodrow Avenue

Cranford, New Jersey
E. C. Wolford
11 English Village

Dearborn, Michigan
J. B. Wallace
9 Byfield Lane

Denver 2, Colorado
Ben T. Clark
1421 Court Place

Elmwood Park 35, Illinois
William J. Lohrey
2047 77th Avenue

Kansas City 14, Missouri
Charles L. Sigman
8906 Holly Avenue

Irwindale, California
G. R. Mergenthaler
15601 Arrow Highway

Prairie Village 15, Kansas
Victor Stewart
7112 Buena Vista

Seattle 55, Washington
William M. Peistrup
19246 Lago Place

Syracuse, New York
Henry Seebach
560 Allen Street

York, Pennsylvania
E. F. Humphrey
327 Lambeth Drive

Heating and Ventilating Shipyard Steel Fabricating Shop

Channel Iron Floor Is Principal Convector For Warm Air Radiant Heating System

BATH, Me. — A warm air radiant heating system utilizing the channel iron floor (required for the work to be done in this building) as the principal heat convector is providing economical comfort heating and ventilation in a shipyard steel fabricating shop here.

This installation—a departure from conventional "wet" radiant heating systems—is in a new 514-ft. long, 82-ft. wide and 54-ft. high building of the Bath Iron Works Corp. The company is a major builder of sea-going vessels for military and commercial use.

UNUSUAL FLOOR CONSTRUCTION

The design and construction of this building included a steel floor using 18-in. channel irons with flanges turned down onto 6-in. channels set in concrete with concrete, brick, glass, and steel walls with flat roof.

There are three large access doors 40 ft. long and 30 ft. high on the side facing the ship ways on the Kennebec River. With one or more of these doors being opened at frequent intervals and often for prolonged periods, excessive heat loss was recognized as a major problem to be overcome, even before the building plans were started.

Bath Iron Works proposed to the Richard D. Kimball Co., heating engineers working with the Morton C. Tuttle Co. who designed and built the building, that the channel irons used for the floor (with flanges turned down) provided a natural set of ducts at no extra cost. They could be used as a warm air version of radiant heating for the finished structure, the company suggested.

This warm air is supplied by six floor mounted Dravo "Counterflo" oil-fired forced air space heaters, each fitted with two 24-in. sheet metal ducts leading to trenches beneath the floor and thence to an underground trench at the center of the building.

From this trench, which extends the full length of the structure, the warm air flows back to both side walls along the underside of the channel iron flooring. At this point it is released through side wall registers and drawn back to the heaters. This unique system assures controlled warm floors plus warm air supply and recirculation in the working zone.

USED 10% LESS FUEL THAN EXPECTED

After one winter's experience with the system, Bath Iron officials report that a temperature of 55° was easily maintained in the shop area for about 10% less fuel consumption than had been expected.

This "better than expected" heating cost, according to Alfred M. Norton, chief plant engineer, was recorded in spite of temperatures frequently as low as -20° in January.

Bath Iron's unique heating installation employs four 1,000,000 B.t.u./hr. Dravo Counterflos with make-up air instakes, and two others of the same output capacity for recirculation of the shop's existing area.

All six heaters discharge air at the rate of 11,000 c.f.m. In addition to the special ducts to the heat trench, the heaters are fitted with a center discharge nozzle delivering warm air directly to the work area.

Two smaller Counterflos, each with a 400,000 B.t.u./hr. output capacity and a warm air delivery of 4,500 c.f.m., are installed at extreme ends of the building for warm air discharge through ductwork into offices and other enclosed areas.

Fired by No. 2 oil, the heat-

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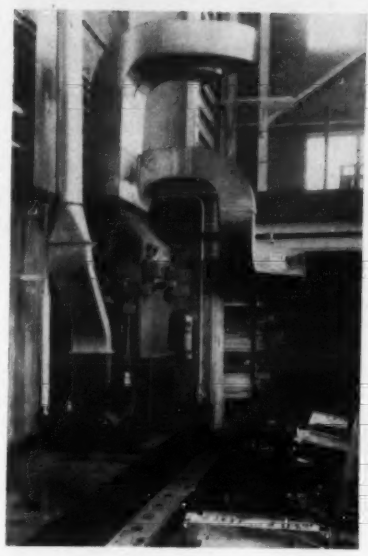
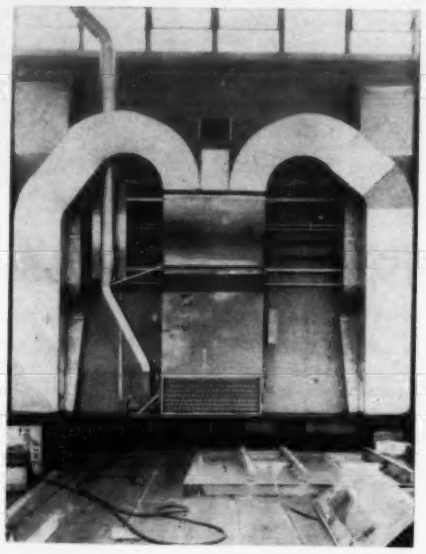
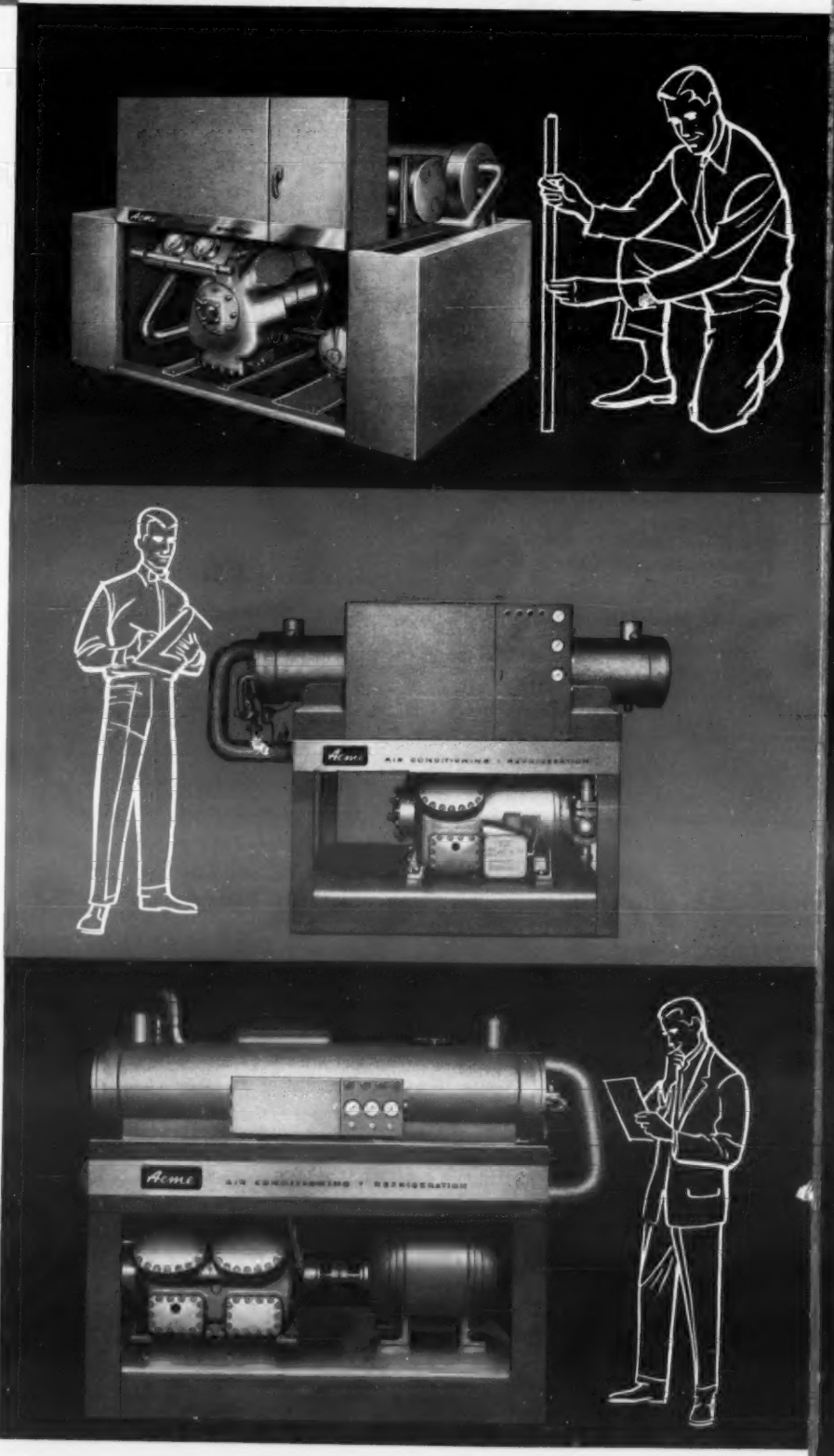




LEFT: One of two 400,000 B.t.u./hr. counterflo heaters positioned at each end of the Bath Iron shop with duct extensions leading to offices and other enclosed areas.

RIGHT: One of six 1,000,000 B.t.u./hr. counterflo heaters positioned along one side of a new steel fabricating shop of the Bath Iron Works at Bath, Maine. Ducts at each side feed warm air to buried trench extending through center of the building. Warm air returns to side walls and out through registers. Louvered dampers in base pan and on one side of heater balance return air and fresh make-up air.

Acme... the **practical** approach to air conditioning



RG 3 to 30 tons

Completely wired and piped unit including controls, circulating pump and operating charge. Hermetic compressor. Extremely quiet in operation. 8 models.

HE 20 to 60 tons

Completely assembled from matched components including all internal wiring and piping, controls and gauges. Hermetic compressor. Operates smoothly and quietly. 6 models.

DE 20 to 125 tons

Factory assembled from matched components, delivered complete with motor coupled to direct drive compressor, controls mounted and wired, and holding charge of refrigerant. Starters optional. Quiet, compact, reliable. 9 models.

(Concluded from preceding page)

ers are equipped with modulating type burners which automatically adjust the flame according to temperature requirements. Each of the heaters is individually controlled by a thermostat mounted on the wall near the unit it controls.

All of the units are set on raised shelves between concrete piers that support steel columns and do not project out beyond these piers onto the clear working area.

Smoke and fumes from burning torches and welding equipment, rising with warm air to the roof, are vented by exhaust fans. Make-up air is brought into the building by four heaters equipped with fresh air intakes.

Dampers in the fresh air supply lines, while manually controlled, may be interlocked with louvered dampers controlling the air return from the shop.

In Leatherhead, Surrey, England

Laboratory Installs Air Conditioning To Aid Experiments with Lithographic Plates

LEATHERHEAD, Surrey, England—A lithographic plate-making room, fitted with air conditioning equipment which will produce conditions that may be experienced in members' printing down departments, is now in operation at the laboratories of the Printing, Packaging & Allied Trades Research Association.

The department also has an automatic exposure meter, which shuts off the arc light for the printing down frame when a predetermined exposure has been given to the plate.

The equipment has been installed primarily for research work on lithographic half-tone reproduction which requires the accurate control of as many variables as possible.

By having this accurate control system, PATRA is now in a position to test the efficiency of litho plates under a range of conditions, it was stated. Arrangements have already been made for tests on a batch of pre-sensitized plates manufactured by a member firm.

The humidifying equipment permits humidities of from 55% r.h. to 75% r.h. to be obtained, with a temperature range of from 60°-75° F. Conditions can be controlled to within an accuracy of ± 2% r.h. and ± 2° F.

Humidification is achieved with an "Aerosol-Turbo" unit, while dehumidification is provided by a refrigerator incorporated in an "Air King" air conditioning unit. Conditions are kept constant by means of an automatic control system of humidistats, consisting of moisture-sensitive elements which expand and contract with changes in humidity, and a series of thermostats.

A booth fitted with an extractor fan has been built to house the open arc lamp assembly so as to ensure that the heat from the lamp does not affect the atmospheric conditions of the room.

A full NEW line of high performance

Acme WATER CHILLERS

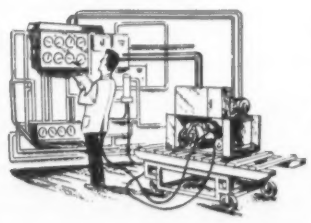
SMALLER • LIGHTER • EASIER TO USE

Here is a completely new line of Acme packaged water chillers, in a full range of sizes, which pack more capacity in less space than ever before. Size has been cut as much as 50%, weight as much as 30%, and costs have been reduced, too. Now you can have the simplicity of a completely factory-assembled packaged unit . . . the rugged reliability for which Acme equipment has always been known . . . and the smooth, quiet performance that you have always wanted—all wrapped up in a smaller, lighter, lower cost package.

These great new Acme packaged water chillers mean that you can save building space . . . cut structural requirements . . . slash installation costs while using top quality Acme equipment.

Complete Acme Systems

In addition to this great new line of packaged water chillers, Acme offers a complete range of water-saving and cooling distribution equipment for both wet and direct expansion systems. Get the full story on the new Acme Packaged Water Chiller line and on other components for a complete Acme system. Call your nearby Acme sales engineer or write directly to the factory.

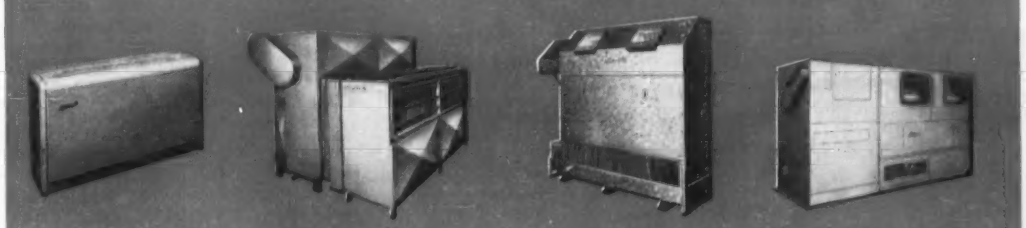


EVERY UNIT TESTED AND CERTIFIED

Every Acme packaged water chiller is tested under operating conditions before shipment. Performance data is recorded on the most modern testing instruments and every machine carries a certificate guaranteeing that the unit has performed according to specifications.

Acme INDUSTRIES, INC.
JACKSON, MICHIGAN
Manufacturers of quality air-conditioning and refrigeration equipment since 1919.

ACME HAS COMPLETE SYSTEMS FOR EVERY AIR CONDITIONING NEED



Fan-and-coil remote room conditioners — *Single and multi-zone air handling units* — *Cooling towers and evaporative condensers* — *Self-contained air conditioners*

Commercial and Industrial Firm Opens In Phoenix

PHOENIX, Ariz. — Brown & Sons Air Conditioning, engaging in industrial and commercial sheet metal work as well as refrigeration, has opened for business at 821 N. 21st Ave.

The firm is headed by Robert K. Brown, who has been active during the past 10 years in a similar business in Las Vegas, Nev., where his firm provided air conditioning systems for resort hotels as well as private homes.

Mel Felsenheld, sales representative for the company has been selling and engineering air conditioning equipment in the Phoenix area for the past 10 years.

Air Conditioned Plants

* * *

Weston Hydraulics

LOS ANGELES — Construction is under way in Van Nuys on a new air conditioned plant for Weston Hydraulics, Ltd., North Hollywood, a subsidiary of Borg-Warner Corp.

Total cost of the project, including land, reportedly will be in excess of $2 million.

Designed by Pereira & Luckman, the new facilities will have an initial total area of 85,000 sq. ft. for development and production of components for aircraft, missiles, and rockets. The air conditioned buildings will be located on a 32-acre site.

Sol Enterprises

SILER CITY, N. C.—A new factory building, completely air conditioned and containing 16,000 sq. ft. of floor space, will be erected here to house Sol Enterprises, Inc., a new ladies' sportswear plant which eventually will employ up to 300 persons.

Carolina Blouse Co.

GREENVILLE, S. C.—Carolina Blouse Co. plans to construct a 133,000-sq. ft. factory building on Laurens Rd., about 1½ miles southeast of the city limits, which will be completely air conditioned the year around.

Peerless Woolen Mills

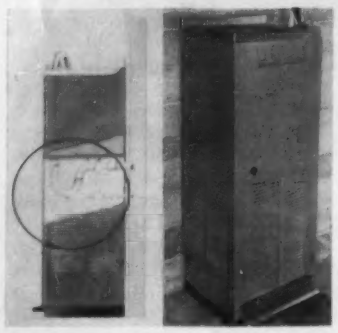
ROSSVILLE, Ga. — John L. Hutcheson, Jr., chairman of the board of Peerless Woolen Mills, makes known that his firm will build an air conditioned plant at Tifton, Ga. Floor space will approximate 175,000 sq. ft.

Weeklies Publishers

ALLENDALE, S. C. — The Weeklies Publishers, Inc., publisher of *The Allendale Citizen* and *The Hampton Guardian,* has announced plans for a new, air conditioned printing plant on the Allendale-Fairfax Highway.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

Westinghouse Water Cooler Hides Plumbing



● A new water cooler that fits flush against the wall and eliminates exposed plumbing, sets the pace for the 1959 water cooler line introduced by Westinghouse Electric Corp., Dept. AH&RN, 653 Page Blvd., Springfield 2, Mass.

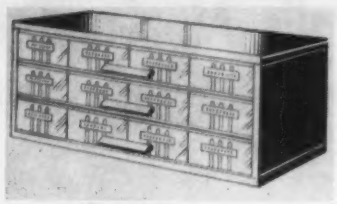
"Our exclusive new 'Wall-Line' is the answer to the requests expressed in our recent survey of over 1,800 of the nation's top architects and builders, for a water cooler that would conserve space and conceal plumbing," said R. S. Sheetz, manager of the Westinghouse water cooler department.

The Wall-Line cooler design "allows for a standard trap with slip type fittings to be installed inside the cooler cabinet, with no need for time consuming soldering or threading of drain or trap fittings," it was stated. "The cooler extends but 12½ in. when installed flush against the wall, and the floor area required is 26% less than the minimum area for a standard cooler installation."

Other features of the new cooler include a straight-through drain, a high back-splasher, and a dual drink control.

Included in the Westinghouse 20-model water cooler line for '59 is a "Bilt-In" model. "Fitting into a space only 6⅝ in. thin, it is ideal for mounting in a wall or under a counter," the company said.

Cabinet Contains Pieces To Repair 150 Terminals



● Redesign of its internal replacement terminals with new features to aid hermetic rebuilders has been announced by Sealed Unit Parts Co., Inc., Dept. AHRN, 1178 East 180th St., New York City 60.

Stressed was the "Interlock," a new feature which locks the terminal stud internally and prevents it from turning as the wires are tightened from the outside.

It was also stated that "a large saving on terminal costs is now offered to repair shops who use two or more sets of terminals per month."

Also announced was Part #KT9, a cabinet containing three shelves, 12 compartments, 24 separators, 18 different terminal parts totaling 1,092 pieces.

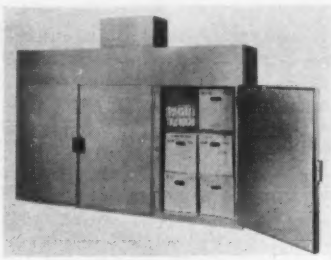
"This total of 1,092 pieces can make 25 complete sets of terminals and 75 individual terminals—enough parts to repair over 150 defective terminals," the announcement said. "These make-up terminal parts will fit all domestic models and almost every commercial model up to 5 hp."

A sealed unit terminal guide is now being developed and will be available soon, the company stated.

Want More Details?

ADDITIONAL details on products that are described on these pages may be obtained by writing the manufacturer at the address given in each What's New story.

Tell him: "AH&RN sent me!"



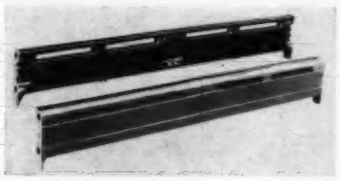
Packaged Egg Coolers Available In 3 Sizes

● A new egg cooler has been introduced by Sunset Equipment Co., Dept. AH&RN, Box 3536, St. Paul 1.

The coolers are designed for use by producers, hatcheries, or egg processors and are available in 6, 12, and 18-case packaged units, and in larger walk-in models.

Made of heavy gauge steel throughout, the outside of the cooler is finished in gray "Hammertone" enamel. The interior is galvanized to protect it from the high humidity conditions that exist inside an egg cooler, the company explained.

High density "Fiberglas" insulation and thermostatic controls are said to maintain the inside temperature at approximately 55° F. Humidity ranges from 80 to 90%, it was noted.



Dunkirk Offers Line of Low Baseboard Radiation

● Addition of a line of cast iron baseboard radiation measuring only 7¼ in. high is announced by Dunkirk Radiator Corp., Dept. AH&RN, Dunkirk, N. Y.

This low line makes it possible to install cast iron baseboard radiation under picture windows and other locations where vertical dimensions are at a minimum, according to the manufacturer.

The panels are furnished in 18 and 24-in. lengths, factory assembled up to and including 8-ft. lengths in 6-in. increments. Panels have integral fins and are designed for use in forced hot water or two-pipe steam systems, the announcement said.

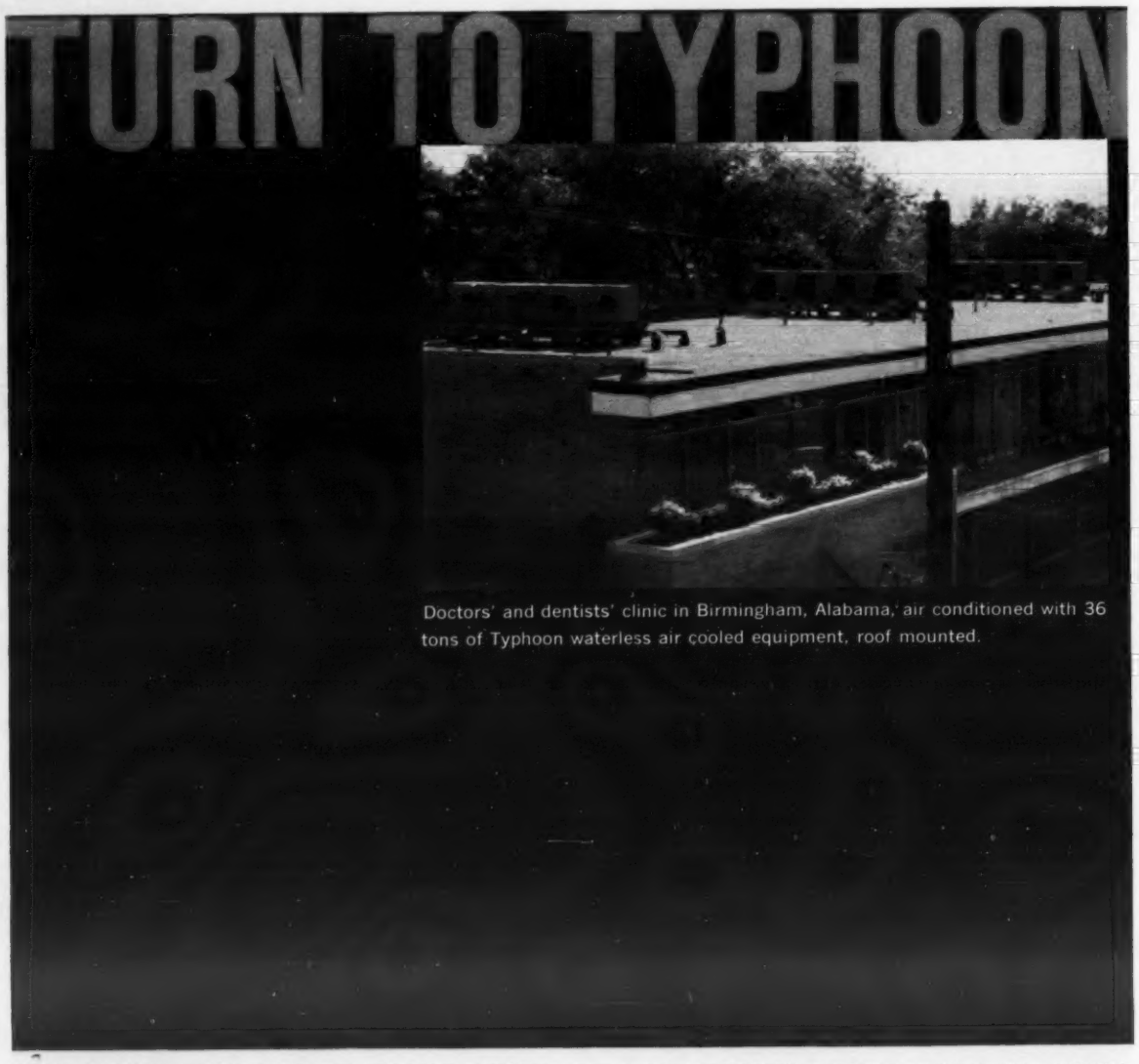
This line with 7¼-in. height is added to the present line measuring 10$^{13}/_{16}$ in. high.

Dehumidifier Comes with Or Without Humidistat

● A new dehumidifier which will "accommodate a closed area up to 14,000 cu. ft." is being offered by Ben-Hur Mfg. Co., Dept. AH&RN, 634 E. Keefe Ave., Milwaukee 12.

The unit is available in two models — 901 without humidistat and 902 with humidistat. It features square type styling, heavy gauge steel cabinet in "Desert Turquoise" finish, additional inner support structure 16-gauge steel, four casters, 2½-gal.-capacity removable drawer-type water container of "Hi-Impact Polystyrene," according to the firm.

According to Ben-Hur, the dehumidifier removes over 3 gals. of moisture per day. It weighs 67 lbs. and is 19⅝ in. high, 14½ in. wide, and 21¼ in. deep. It uses 130 watts under average conditions and "positive air circulation c.f.m. is 250 plus, giving at least one air change per hour," the company said.



Doctors' and dentists' clinic in Birmingham, Alabama, air conditioned with 36 tons of Typhoon waterless air cooled equipment, roof mounted.

AND HAVE THE RIGHT EQUIPMENT, AT THE RIGHT PRICE, EVERY TIME!

Now you can fill every need, solve any problem with Typhoon's exclusive residential, commercial and industrial equipment! A full range of air cooled units from 2 tons to 20 tons, both packaged and as split systems. Water cooled units from 3 tons to 75 tons. Remote air cooled condensing units to 20 tons, water cooled to 75 tons. Gas and oil fired furnaces in horizontal, vertical upflow and counterflow types. And now, Typhoon's line of compact air-to-air heat pumps will open a new era in air conditioning for you. Each and every unit with built-in Power Reserve—a combination of superior components and oversize parts that insures dependable performance above rated capacity through all weather extremes. All copper condensers in water cooled units, largest coil surfaces and rugged 11 and 14 gauge metal cabinets. Find out how Typhoon quality and flexibility can add to your reputation for getting the job done better, faster, more economically—with more profit for you.

TYPHOON
DIVISION OF HUPP CORPORATION

Typhoon Air Conditioning Company, Division of Hupp Corporation
505 Carroll Street, Brooklyn 15, New York

☐ Have a representative call me for an appointment.

☐ Please send full product literature.

Name_____

Firm_____

Address_____

98-1

TECHNICAL CENTER

By Frank J. Versagi, Technical Editor

Plastic Terminology, Application (2)

The cellulosic plastics discussed last week are frequently referred to by their "last name" only. Frequently you will hear such terms as *acetate tape* or *butyrate pipe,* instead of cellulose acetate or cellulose acetate butyrate respectively.

Knowing the general applications of the several plastics does not make identification in the field any easier.

Even experts can't tell what a car door handle or a distributor cap is made of just by looking at it because there are several plastics which can serve the purpose. This is in no way different from the fact that a metal man could not tell which of several brass alloys is used in a part where a choice of materials exists.

But he will know that it is brass and not steel, or zinc base and not aluminum. Similarly, familiarization with plastic terminology and applications will allow you to make class distinctions.

Almost everyone has had the experience of accidentally heating a plastic item and having it distort. Thus, if you hold a cellulose acetate brush handle in hot water, it will deform. Many polystyrene toys left too close to radiators or registers have been ruined.

On the other hand, there are now plastic items, like dinnerware, which will withstand boiling water, or which can be used under the hood of a car next to the block; which can be used on a compressor where high temperatures are the usual.

This ability, or not, to soften and become workable with heat forms a major distinction between plastics.

Those materials which can be softened with heat and reformed or distorted are thermoplastic materials. Those plastics which, once formed and cured, cannot be subsequently reheated and reworked are termed thermosetting materials.

Cellulosic plastics just described are thermoplastic; they will reform or distort under heat. In classifying wire insulation, Underwriters use "Thermoplastic Materials" as one designation.

The best known early thermosetting plastic was "Bakelite." Although this name now refers to a division of Union Carbide & Carbon which produces many plastics, it originally referred to the single plastic material which found use as electrical and thermal insulation and is still to be found on frying pan handles and switch housings and components.

Chemically, this material is a **phenolic,** specifically, a phenol-formaldehyde product plus specific fillers. When cured by the application of heat, and sometimes simultaneous pressure, chemical changes take place which set the plastic so that further heat does it no harm—to relatively high temperatures.

Phenolic resins can exist as solid or liquids, sometimes alcohol solutions are used as varnishes. In fact, phenolic varnishes are commonly used in electrical insulations. "Bakelite," "Durez" are common trade names for this material.

Normally brown or tan in appearance, the practical properties of phenolics depend in great part on the fillers used. Fillers may be anything from asbestos or cotton to glass fibers or even ground phenolic scrap. The molded phenolics are found in motor spacers, electrical plugs and outlets, distributor caps. Laminated types are used in panel wiring and printed circuits.

So we have seen examples of each of the two distinctive divisions of plastics—the cellulosics in the thermoplastic division, the phenolics in the thermosetting division.

Before continuing, it will be well to become familiar with a few more basic terms which will be used, terms without which it is impossible to discuss plastics intelligently to any degree.

We'll begin with the directly related terms **polymer** and **monomer.** The prefix **poly-,** of course, means many. Thus polyclinic means a clinic able to treat many diseases. Polyvinyl means many vinyls. Polyethylene means many ethylenes. Polygamy means a jail sentence.

A polymer, therefore, is a chemical composed of many monomers. An example; ethylene is a gas with a simple chemical formula. Under the proper conditions of temperature and pressures, the ethylene monomer can be made to join with other monomers forming a long chain-like structure. Instead of a gas, this polymer of ethylene, or polyethylene, is a solid—a whitish, translucent, waxlike material used for food dishes and refrigerator storage containers.

Similarly, vinyl chloride is a simple substance, a monomer. When forced together into larger molecular groups (polymerized), the resultant material is polyvinyl chloride.

Since a majority of synthetic plastic materials are made by this process of forcing monomers to join together to form polymers, the prefix poly is repeatedly encountered in discussing plastics.

Another term frequently met is **resin.** Rather an ambiguous word, resin is accepted to mean any of a class of solid, semi-solid, or viscous liquid materials of natural or synthetic origin. Generally they are high in molecular weight and have no definite melting point.

Plastic materials, in general, are sometimes referred to as resins, especially when they are in the powdered state, flake, granule, or liquid prior to being molded, extruded, or fabricated in some way.

(To Be Continued)

Suppliers of Foamed-In-Place Thermal Insulation

Reader response to the discussion of foamed-in-place thermal insulation in the Jan. 12 Tech Center was such that the NEWS here prints a list of the major suppliers of the polyurethane prepolymers needed for this technique. The list was supplied by Du Pont "Freon" Products Div. who noted that "these suppliers are familiar with the use of Refrigerant-11 as a foam blowing agent."

CALIFORNIA

American Latex Products Corp.
3341 W. El Segundo Blvd.
Hawthorne

Nopco Chemical Co.
4858 Valley Blvd.
Los Angeles 32

Polytron Corp.
2131 University Ave.
Berkeley

DELAWARE

Isocyanate Products, Inc.
P.O. Box 1681
Wilmington

ILLINOIS

The Glidden Co.
1856 N. LeClair Ave.
Chicago

Pelron Corp.
7740 W. 47th St.
Lyons

Witco Chemical Co.
Polyester Products Dept.
75 E. Wacker Dr.
Chicago 1

MASSACHUSETTS

B. B. Chemical Co.
784 Memorial Dr.
Cambridge 39

MICHIGAN

Minnesota Mining & Mfg. Co.
417 Piquette Ave.
Detroit 2

NEW JERSEY

Nopco Chemical Co.
175 Schuyler Ave.
North Arlington

Thiokol Chemical Corp.
780 N. Clinton Ave.
Trenton 7

NEW YORK

Reichhold Chemical Industries
525 N. Broadway
White Plains

OHIO

Dayton Rubber Co.
Dayton

General Tire & Rubber Co.
Akron

PENNSYLVANIA

Chase Chemical Corp.
3527 Smallman St.
Pittsburgh 1

Pittsburgh Plate Glass Co.
One Gateway Center
Pittsburgh 22

TEXAS

Thermal Products Co.
1213 Hardy St.
Houston

WASHINGTON

General Plastics Mfg. Co.
P.O. Box 65-S
Tacoma

For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

Only 25¢ each.

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VALVES
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A complete line of refrigeration steel shut-off valves for all automotive applications. Over fifteen years of proven field usage. There is no substitute for experience.

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"O" RING MOUNT

RECEIVER-DRIER
ROTALOCK
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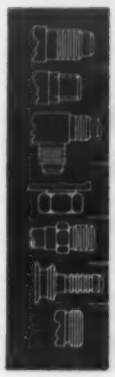
"O" RING
PIPE "DRYSEAL"

VERSATILITY!
You can get *any* connection for *any* valve.



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All Primore valves are precision manufactured. Furnace brazed, flexible construction reduces costs. Your Engineering, Purchasing and Production departments benefit.

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Diagnosing & Servicing Hermetic Compressors

(4) Installing Replacement Motor Compressor and Complete Reprocessing of Refrigeration System

Written by Tom Pendergast, vice president, Employers Insurance Service, Inc., with more than 30 years' experience in manufacturing, selling, and servicing refrigeration systems, these articles cover such basic problems as low voltage, refrigerant restriction, moisture removal, compressor replacement, evacuating, and charging. They supply quick review for the experienced serviceman and a comprehensive introduction to service techniques for the novice.

INSTALLING THE REPLACEMENT MOTOR COMPRESSOR

To install the replacement motor compressor assembly, proceed as follows:

1. Mount the replacement motor compressor assembly on the condensing unit, connecting the lines immediately to exclude air and moisture, then using the mounting bolts removed from the inoperative motor compressor assembly, mount the new one.

2. If the change is properly planned the lines can usually be connected while there is still a small amount of gas coming out of them; this procedure prevents air from entering.

3. Remove the seals from the suction line and discharge fittings on the motor compressor assembly and attach the lines to them. Be sure that all fittings are tight.

4. Attach the service cord and control wires to the correct terminals under the relay terminal cover, following the wiring diagram on the inside of the terminal cover.

5. Remove the seal plug or cap from the charging port of the suction line valve and install the charging line on which a compound gauge has been mounted. Attach a copper tube charging line to the suction valve and attach the other end to a drum of the proper refrigerant. Loosen the charging line fitting at the valve and open the refrigerant drum valve to purge the charging line. Close valve and tighten the charging line fitting.

6. Open the charging port on the motor compressor assembly and the refrigerant drum valve and allow pressure to build up to at least 75 to 85 p.s.i.g. Close the valve.

7. Check the complete system for leaks. Eliminate any leaks that are found before proceeding.

8. Add the correct amount of refrigerant to the system as described earlier.

Warning: If a burned odor is noticed when the system is opened, it indicates that the motor stator winding has overheated and burned. Before proceeding, the system must be reprocessed.

COMPLETE REPROCESSING OF REFRIGERATION SYSTEM

Moisture and foreign material in a refrigeration system are a major cause of complete failure or poor operation.

Compressors and condensing units furnished by all compressor manufacturers have been subject to rigid inspection insuring that they are properly dehydrated, clean, and sealed when shipped from the factory. However, moisture and foreign materials may be admitted to the system during installation and service operations or by the failure of a motor compressor assembly due to a burned stator winding.

Moisture in a refrigerating system will cause many operating difficulties, such as freezing or plugging of the capillary, expansion valve, or other metering device.

Of greater importance is the effect of moisture on the internal parts of the system when in contact with the refrigerant and oil.

Excessive moisture will also cause motor winding insulation to break down resulting in short circuits and grounds. The addition of so-called antifreeze agents, while eliminating the effects of water freezing at the point of expansion does not eliminate the presence of water and the resulting chemical reactions.

Accordingly, it is not recommended that any alcohol or liquid antifreeze agent be added to a refrigerating system. To do so will void some warranties.

In cases where a failure of the motor compressor assembly occurs due to burned windings, additional acids and sludges are formed due to the presence of heat during the "burnout" period.

When a refrigerating system becomes contaminated to the point where it is necessary to completely reprocess the system, it is suggested that the system be removed to the shop. If proper equipment, i.e., vacuum pump, dehydrating oven, etc., is not available it is recommended that the work not be attempted.

REPROCESSING A HERMETIC SYSTEM

1. Allow the complete refrigerant charge to escape. No attempt should be made to save refrigerant or oil since it would be contaminated.

2. Disassemble the complete low side, i.e., liquid line, evaporator, and suction line, from the condensing unit. Remove temperature control, expansion valve, and all accessories from the low side.

3. The inner surfaces of all coils, evaporators, refrigerant lines, and all refrigerant containing parts, should be thoroughly washed with a good solvent and blown out, using dry air or anhydrous nitrogen. The used drier should be discarded.

4. Seal the liquid line with an appropriate fitting and attach the suction line to a hand shutoff valve if practical.

5. Place the complete low side assembly in the dehydrating oven and connect the vacuum pump to the hand shutoff valve. Make sure that all connections are tight.

6. Bake the low side assembly at a temperature of 275° to 300° for a period of at least four hours, and at the same time operate the vacuum pump being sure that the system is on a low vacuum.

(If it is impossible to use an oven for the baking process, the complete system should be heated, using a blow torch or Presto-lite torch and starting at a point farthest from the vacuum pump, work toward the pump, heating each section, until it is hot to the touch. Care should be taken not to overheat soldered joints, etc.)

Infrared lamps are also effective if the entire evaporator can be heated with them.

7. After baking and dehydrating for the recommended time and at a low vacuum, the hand shutoff valve should be closed, the vacuum pump stopped, and the oven turned off.

When the system has cooled sufficiently, a drum of refrigerant should be connected to the hand shut-off valve through a line and "T" arrangement on which a pressure gauge is installed. Purge the line. The hand shutoff valve can then be opened to break the vacuum.

Allow a pressure of 15 p.s.i.g. to build up in the evaporator and then close the hand shutoff valve and remove the refrigerant drum. If there are any solder joints to make when reassembling the system they should be made with anhydrous nitrogen drifting through the tubes to avoid oxidation.

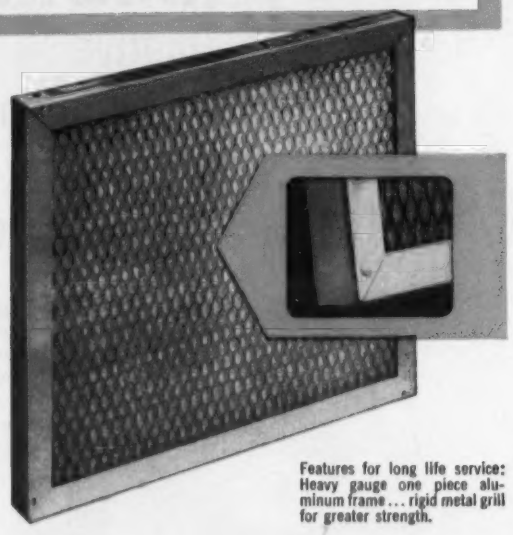
8. The condenser, receiver (if any), and lines on the condensing unit should be treated in a manner similar to the above. The motor compressor assembly should be removed from the unit prior to this operation.

9. After all system components, lines, and parts have been thoroughly cleaned, dehydrated, and charged with refrigerant as outlined above, the component parts can be reassembled. A replacement motor compressor assembly should be installed and the inoperative motor compressor assembly properly sealed against the atmosphere and returned to the factory.

10. The system can now be charged with refrigerant and leak tested as outlined earlier.

(The End)

You make more profit per filter sale with Skuttle-aire permanent filters!



Features for long life service: Heavy gauge one piece aluminum frame ... rigid metal grill for greater strength.

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SKUTTLE-AIRE permanent filters are available in all sizes for furnaces, central air conditioning systems and room coolers.

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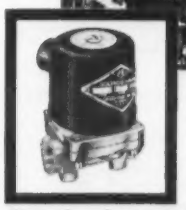

J-E SOLENOID VALVES

Quietly and Dependably Control the Personalized Air Conditioning in 475 Guest Rooms

Owned and operated by Tisch Hotels, Inc., the Americana has individually-controlled air conditioning, for heating or cooling, in every guest suite. To assure quiet, dependable, personalized control of room temperatures, the air conditioning contractor (Hill York Sales Corp.) selected Jackes-Evans Solenoid Valves.

For complete satisfaction on *your* jobs also, *specify* J-E Valves. Call your wholesaler or write direct today.

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Classrooms Completely Cooled

School Board Buys Air Conditioning Because It Permits Close to 100% Efficiency from School

LANSING, Mich.—Michigan's first high school with completely air conditioned classrooms is currently under construction here.

The new Everett high school on Lansing's south side is expected to be completed by July 1 and ready for operation for the fall term in September, according to E. Roger Hewitt, consulting engineer on the project.

The $4 million educational plant will have three floors of classrooms and a single story administrative section air conditioned by a chilled water system.

Cooling is being installed at a price the school board couldn't prudently refuse, Hewitt said.

Two sets of bids were called for, he explained. One included the cooling equipment and cooling towers. The other made the system ready for cooling but omitted the refrigeration equipment.

Cooling Would Cost $50 Per Ton

"We were surprised to find that there was only $40,000 difference on a 220-ton system between having the air conditioning and not having it. That amount to about $50 a ton for air conditioning.

"We had no trouble convincing the school board that they could never hope to add air conditioning at a later date for less money than they could get it right now. They took it."

Efficiency Gain Estimated at 25%

Hewitt pointed out that the school board justified the addition of air conditioning economically because it will permit close to 100% efficiency from the building rather than the normal 75% efficiency attained in nine months' operation from the normal school.

"With facilities available for 1,600 to 2,000 students, the school board plans to consolidate all summer school activities and many adult education activities here," Hewitt declared.

Installation of heating and cooling equipment is being made by the R. L. Spitzley Co. of Lansing and Detroit.

An American Blower "Tonrac" centrifugal water chiller will provide 46° F. water to 101 through-the-wall Trane fan-coil units, seven Warren Webster units, and 12 ceiling mounted Trane "Climate Changers" in 42 classrooms, 24 offices, and the library.

Auditorium, gymnasium, and student lounge in separate wings of the school will be ventilated and heated but not air conditioned, Hewitt said.

He pointed out that the Climate Changers are used in laboratories and other special purpose rooms where walls are lined with cupboards and benches.

The "Unitrane" and model F fan-coil units draw fresh air from the outside. The seven Webster units, in interior offices, recirculate air only. All are individually controlled.

Completing the system are two packaged Marley induced draft cooling towers. The packages were selected over a single built-up tower because of their economy, Hewitt explained.

Hewitt said he selected this type of system because of anticipated variable load conditions. The system can operate efficiently at anywhere from 25% to 100% capacity.

The school will be heated through the same piping system. Three 10 million B.t.u. International Lamont gas-fired boilers provide high temperature hot water at from 300° to 320° F. Pressure is maintained with nitrogen.

Adsco heat exchangers reduce the high temperature water to about 180° F. to 200° F. for circulation in room units.

Unlike other school buildings, Everett high will not have the usual large area windows. Instead, windows are only 4 ft. high and set high in the wall.

This not only cuts the sun load on the building but also saves the cost of blinds and drapes normally needed to reduce glare. Artificial, steady quality illumination will be used at all times.

The school will also have a circulating drinking water system consisting of a 10-hp. Dunham-Bush drinking water chilling unit with circulating piping to all drinking fountains throughout the building.

O. J. Munson Associates of Lansing is the architect on the job.

Contract Awarded for 40-Story Office Bldg.

NEW YORK CITY—Contract for air conditioning, heating, and ventilating of a 40-story office building to be erected at 80 Pine St. has been awarded to Raisler Corp., it was announced recently by Samuel Rudin, builder.

The proposed building was designed by Emery Roth & Sons, architect, with James Ruderman and R. L. Stinard as consulting engineers.

Air Conditioned Class Rooms Set For Parris Island

PARRIS ISLAND, S. C.—Capt. W. C. Binkly, USN, resident officer in charge of construction, said recruits undergoing training in the Second Recruit Training Battalion here will soon be able to enjoy the comfort of air conditioned class rooms.

Construction has started on the new buildings, which will take the place of one wooden frame building currently in use.

According to Capt. Binkly, the new brick and completely air conditioned class rooms are to be similar to those now being used in the First and Third Recruit Training Battalions.

Easy-To-Install, Reliable, Low-cost "BUFFALO" Belted Vent Set "Packages"

"Buffalo" Belted Vent Sets are uniquely flexible "packages" readily adaptable to a wide variety of ventilating and air conditioning jobs:

- **Smaller, Independent Systems**
- **Larger Systems with Variable Needs**
- **Separate Systems in Different Areas**
- **Indoor or Outdoor Installations**

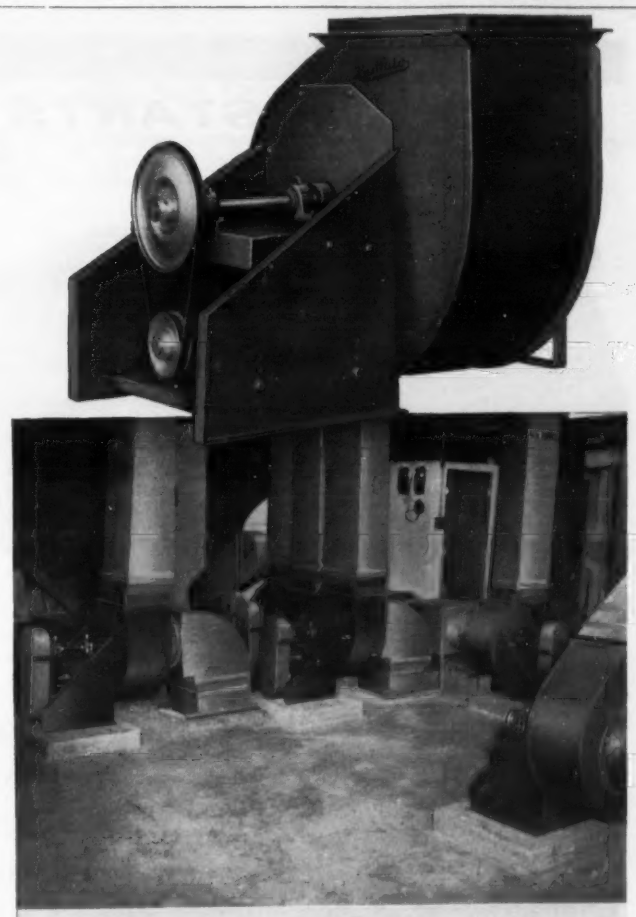
"Buffalo" Belted Vent Sets are easy-to-install because they are shipped as compact, self-contained, "ready-to-set-up-and-operate" packages. Each unit is complete with fan, motor and V-belt drive.

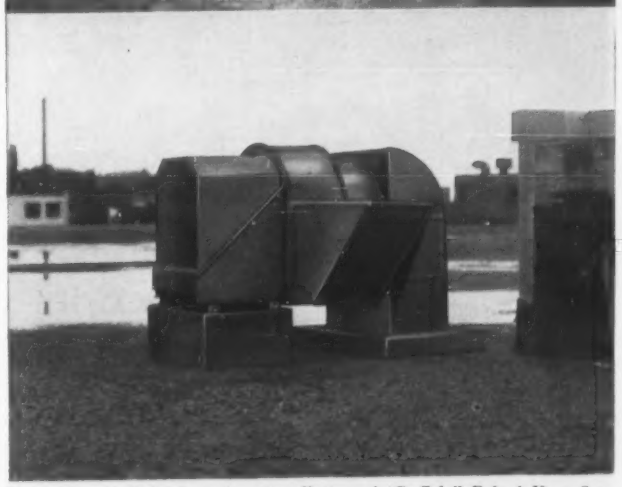
Service problems are minimized because these dependable units are ruggedly built throughout. Heavy-gauge steel housings, oversize shafts and bearings contribute to a long, useful life of maintenance-free operation. This adds up to far fewer service "headaches" for you.

Performance is outstandingly quiet, efficient, economical. This is the result of Buffalo's "big fan" features: smoothly-curved inlet vanes reduce turbulence—backward-curved blades give non-overloading characteristic — factory-balanced wheels minimize vibration.

Capacities range from 500 to 20,000 cfm. Adjustable pitch motor sheaves permit variable capacities for future needs. Can be supplied with special protective coatings or special materials for use as fume hood exhausters.

Investigate the many advantages of "Buffalo" Belted Vent Sets. Contact your nearby "Buffalo" engineering representative, or write for Bulletin 3720-A.





Upper photo: Multiple indoor installation of "Buffalo" Belted Vent Sets. *Lower photo:* "Buffalo" Belted Vent Sets are available with all-weather drive cover for roof or other outdoor installations.

"Buffalo"

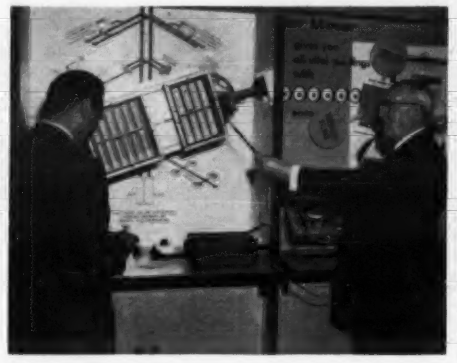
BUFFALO FORGE COMPANY
Buffalo, New York
Buffalo Pumps Division, Buffalo, New York
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING • AIR CLEANING • AIR TEMPERING • INDUCED DRAFT • EXHAUSTING
FORCED DRAFT • COOLING • HEATING • PRESSURE BLOWING

Philadelphia Show Featured New Products Displays, Demonstrations

Pictures on this and several other pages of this issue are of products shown at the International Heating and Air Conditioning Exposition recently held in Philadelphia. For further information on any of these products please write the manufacturer. Additional picture coverage of the show appeared in the Feb. 9 issue and more will appear in future issues.

OPTIONAL PLENUMS for discharge and return air make Frigidaire's ASZ-500 Store Unit flexible for use in any location. Sales representative William Winn shows the recessed controls to Julia K. Weber, Camden, N. J. and Bob Olt, Haddonfield, N. J.

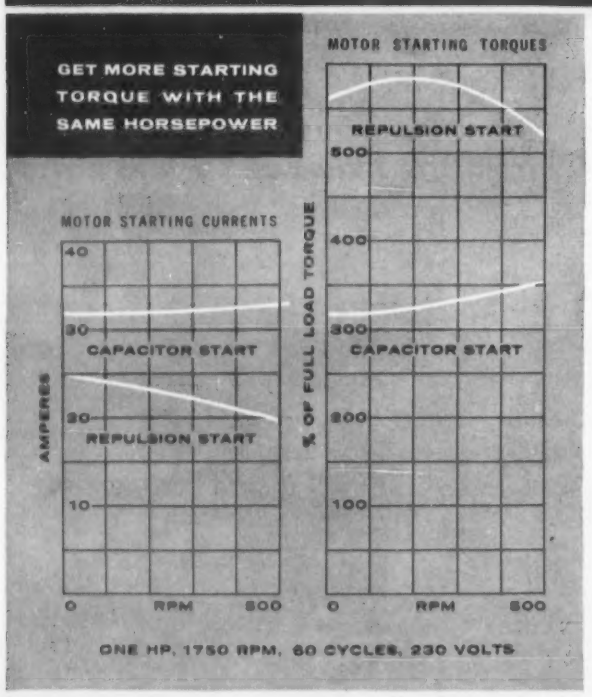


DEMONSTRATING USE of new probe type gas flow meter for measuring velocity, temperature, and static pressure over a wide range is V. F. Self of Anemostat Corp. of America (r.). Watching demonstration is B. Y. Scott, mechanical engineer from Dayton.

"WITH LEGS" is a feature of this new model GLA gas-fired winter air conditioner, attended by Mary Gerdnic and shown by the American-Standard Air Conditioning Div.

TOUGH STARTS MADE EASY...

WAGNER REPULSION-START INDUCTION MOTORS



START HEAVY LOADS WITH EASE

STAND UP UNDER LONG SERVICE

USE EXTREMELY LOW STARTING CURRENT

Starting heavy loads is a natural for Wagner Type RA Motors. Widely used for high starting torque applications, like farm machinery, compressors, pumps and grinders, this rugged single phase motor requires very low starting current that minimizes light flicker. You get smooth performance with a constant high operating speed, even under overload, and a flat efficiency curve over a wide operating range.

You practically eliminate service problems when you power tough single phase applications with these motors. They have unmatched ability to start high inertia or heavy friction loads repeatedly and they give many years of unfailing service.

You can get these motors from leading motor distributors in your community or through Wagner Sales Offices in 32 principal cities. Your Wagner Sales Engineer will be glad to help you select the right motor for your application. Wagner Bulletin MU-220 gives full details on Repulsion-Start-Induction Motors.

WH59-8

Wagner Electric Corporation

6441 PLYMOUTH AVENUE, ST. LOUIS 14, MISSOURI

SERVING 2 GREAT GROWTH INDUSTRIES ... *ELECTRICAL* ... *AUTOMOTIVE*

FIRE-RESISTANT FACING, meeting National Bureau of Fire Underwriters' requirements, is a feature of the Gustin-Bacon Mfg. Co.'s "Ultralite" duct liner being shown by G-B Sales Engineer Frank Kane to Gene Cousart of Philadelphia. The flexible duct liner is claimed to be the only one with permanently stamped density and fire spread classification on it.

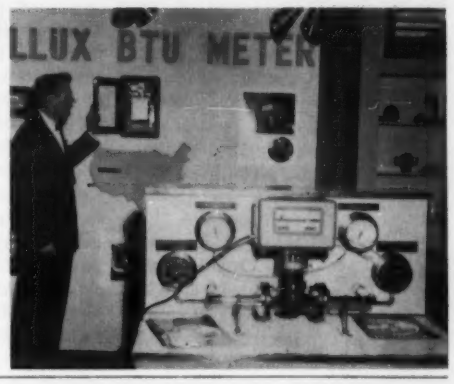
LOWER, NARROWER, and longer is the design of the Binks model WT-10 "Watertemp" cooling tower which James Doherty (back to camera) is demonstrating. This is a 10-ton model, range of this series is from 5 ton 60 tons.

85% EFFECTIVE FILTRATION, according to National Bureau of Standards' tests is claimed for HP-100 filter being shown here by L. S. Greco of Farr Co.

TOTALLY ENCLOSED shaded pole motor for air moving application is studied by model at Delco Products display. Copper bar shade coils are coated to prevent welding to stator iron.

FOR "CORRECT C.F.M." automatically for cooling and heating, Morrison Products, Inc. demonstrates its "Du-Air" 2-volume air delivery damper control blower for residential air conditioners.

NEW HI- AND LO-BOY gas and oil-fired furnaces were introduced by Thatcher Furnace Co. Joyce Trent shows off two of the new models.



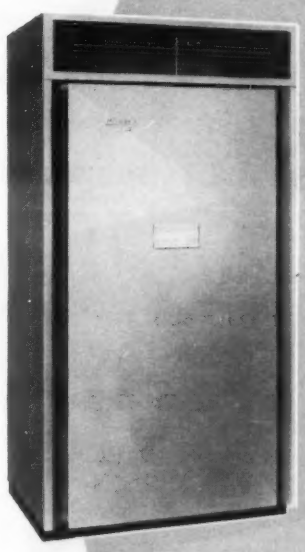
B.T.U. CONSUMPTION can be recorded and totalized with the new recorder displayed by Air Conditioning Equipment Corp. Ken Davidson, manager, explained that the recorder takes information relayed from anywhere in the system. Same units are in the new Kaiser Industries building, Oakland, Calif.

INSPECTING SIGHT GLASS built into expansion valve by Detroit Controls Div., American-Standard, is George Crow of Memphis, Tenn. (l.). T. C. McKee, central regional manager for Detroit Controls, called it the new 718-W expansion valve.

LP CENTRIFUGAL PUMP for air conditioning and refrigeration applications is shown by Charles M. Sliney, sales engineer for Taco Heaters, Inc. (l.), to Richard Amey, vice president of New Yorker Steel Boiler Co. Range is 1 to 10 hp.

HOLDING "BALL-O-MATIC" tubular bracket with solid brass ball-jointed rod holder for multi-blade dampers is Lydia O'Connor. Made by Elgen Mfg. Corp., Ball-O-Matic is self-aligning.

You get a BIGGER PROFIT from Curtis



Packaged air conditioning units —3 through 20 tons.

Here are three important reasons why . . .

MINIMUM SERVICE

Long operational life of Curtis equipment combined with peak performance, assures more customers and less service requirements.

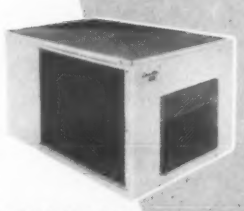
PRE-SOLD PROSPECTS

National advertising beamed at virtually every prospect category helps pre-sell Curtis equipment for you. Curtis provides sales and promotional aids to make your selling job easier.

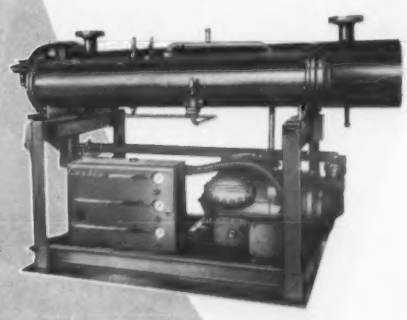
PRICED FOR PROFITS

All Curtis equipment is competitively priced, with a very generous profit margin for you!

Remember, there is no finer, more efficient, durable line on the market today. Depend on Curtis for quality and profit.



Packaged Air Cooled Air Conditioning Units —2 through 7½ tons. Residential and commercial applications.

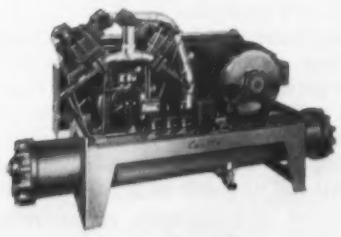


Packaged Liquid Chillers—7½ through 100 tons—F-12 or F-22—with new 1959 Curtis Motor-Compressor Unit.

Packaged Air Conditioning Units—20 through 50 tons—with the new 1959 Curtis Motor-Compressor Unit.

REMEMBER YOU CAN COUNT ON Curtis

MANUFACTURING COMPANY
REFRIGERATION DIVISION
Write: Dept. 1 • St. Louis 20, Mo.



Condensing units up to 100 tons —F-12 or F-22.

C-54 OUR 105th YEAR

Heat Pump Service Costs, Performance Data--

(Continued from Page 1)

tion which are presented at the end of this report on the symposium presentations.

Speaking specifically of large installations like school systems, W. A. Spofford, heating and cooling engineer, Air Conditioning Dept., G-E, admitted that "We have only four or five years' experience as yet to compare with conventional school plants designed for 20-25 years."

In his prepared discussion of the performance of a package air-source heat pump, Spofford showed that at a 70°-indoor/45°-outdoor condition the theoretical Coefficient of Performance based on Carnot cycle would be 21.2. However, when all is done which must be done —things like taking care of air flow, fans, piping, compressor— the COP drops to a practical 2.6 or so.

"Heat pumps are best applied where the major consideration is cooling," he stated; "this makes for ideal applications in commercial and some residential installations. A major advantage of the air-source heat pump is that it never runs out of air." This latter point was made in humorous reference to a previous discussion of water-source equipment where the lake level had dropped, leaving the building with no heating or cooling.

Only mechanical problems were really significant in a power house installation of three centrifugal water chiller heat pump systems totaling 590 tons, said J. Donald Kroeker, consulting engineer, Portland, Ore.

Kroeker stated that a $22,000 savings was realized on electric power for heating as opposed to resistance heat, with the water source heat pump operating at a COP of 4.5. The COP had been estimated at 6.

Ceiling and wall panels are heated by water with a condenser leaving temperature of 135°, he continued, in a publishing building in the Northwest. There is no supplemental resistance heat, but heat recovery from exhaust air is made by well water.

"Two units were installed, with the second designed to cut in at 25°. As it developed, however, a single machine carries the load down to 10°. This application was not fully instrumented to make a fully authoritative cost study, Kroeker admitted, adding that the cost of such instrumentation is a deterrent to making very many comprehensive cost analyses of heat pump installations.

A 212,000-sq. ft. building in the Northwest is being heated by water-source heat pumps at a cost of 2.2¢/sq. ft. as compared with the national average of 7.74¢, he continued. "Cooling is accomplished for 9.1¢/sq. ft. —considerably less than the national average."

Is Operator Needed On 24-Hour Basis?

During floor discussion, it was pointed out that a normal steam boiler may be operated overnight without someone in attendance, but that "a complex machine like a heat pump with all its controls will need a qualified operator on hand 24 hours a day."

Several of the speakers countered this by stating flatly that they knew of some 500 heat pump installations, not one of which uses a full-time operator. In fact, many times, locks are placed on machine rooms so that no one is allowed to enter. In one large heat pump installation at a newspaper, less than one hour a day is spent in the machine room by the general operating engineer.

For the Southwest, also, water-source heat pumps are very effective, according to F. L. McFadden, Jr., partner, Zumwalt & Vinther, Dallas. He described an installation using lake water as a source. "Years of temperature measurements had shown that the lake water was always in the 80-48° range, making it ideal for a heat pump.

11 Separate Zones Used

Eleven separate zones were used to handle the installation which has a peak cooling load of 125,000 B.t.u. Fan coils, filters, face and by-pass dampers, two compressors, one condenser, one receiver, and one monochiller make up the system which is able to deliver six stages of capacity.

Two water circuits are involved, one from-and-to the lake, the other a recirculating system through the coils. On heating cycle, water circuits are reversed.

Diverting valves feed either warm water from condenser or cold water from chiller to each zone. It takes seven zones of heating or cooling to change the cycle of the heat pump.

"All the startup problems had to do with water circulation," explained McFadden. "Water hammer during cycle change, loss of prime at the lake pump." Original three-way valves which took 30 seconds to fully close or open allowed all the water in the system to be pumped into the lake. "The valves have been changed."

The system is operating with a COP of 3.6, said McFadden.

Large central type air-source heat pumps can adopt several techniques to achieve economy, stated E. R. Ambrose, head, air conditioning division, American Electric Power Service Corp., New York.

Exhaust Air Can Be Used as Heat Source

Exhaust air from buildings can be used as a heat source for a water heater heat pump, he cited as an example. Placing a liquid refrigerant coil in the ventilation intake will reheat the air and cool the refrigerant. "A little engineering forethought can often make the different between a so-so installation and a truly effective one," he held.

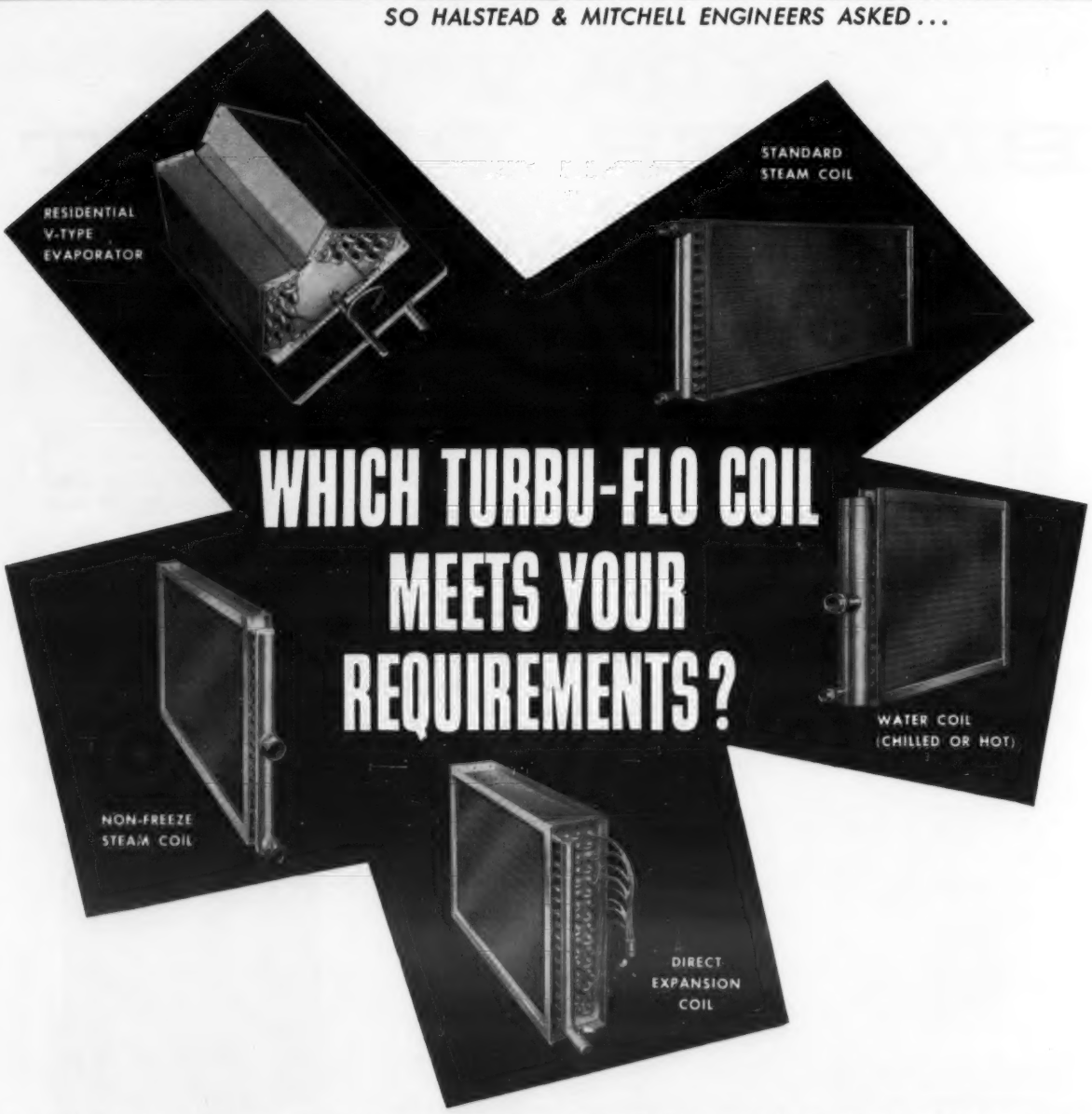
Supplemental heat is frequently taken care of by lighting loads. "One of the advantages of using a cooling unit to heat is that less total kilowatts may be used in winter than in summer," Ambrose added.

Answering a question on this last point, he explained that where lights are used as supplemental heat, they are wired so that both the lights and any resistance heat will never be on at the same time.

Compound heat pumps are a solution where evaporator and condenser temperatures are necessarily such as would re-

(Concluded on next page)

SO HALSTEAD & MITCHELL ENGINEERS ASKED . . .



Halstead & Mitchell coils with Turbu-Flo fins are designed for rugged and long service life. And Turbu-Flo provides up to 15% more heat transfer capacity.

STEAM COILS are available in both standard and non-freeze types. WATER COILS are for use with chilled or hot water. DIRECT EXPANSION COILS are equipped with a pressure type distributor and circuited for minimum refrigerant pressure drop . . . will accommodate any make expansion valve, refrigerants 12 or 22. All coils are regularly available in from 1 to 8 rows deep, in finned heights of 12 to 36 inches, and in lengths up to 10 feet. Manifolding can be arranged for left, right or opposite-hand connections. Other sizes or special coil types can be provided to meet your specifications.

EXCLUSIVE, EFFICIENT TURBU-FLO

All coils feature the exclusive Turbu-Flo fins. Streamline design creates better air wash, lowering air film resistance and improving heat transfer; yet friction is at a minimum. Turbu-Flo fins are made of aluminum (available in copper), mechanically bonded to seamless copper tubing.

Casings are of heavy gauge steel fully protected against corrosion or of heavy gauge aluminum. Surrounding flanges simplify ductwork installation.

Write for more specific information, delivery and prices. *Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.*

HM Halstead & Mitchell

Heat Pump--

(Concluded from preceding page)

quire an excessive compression ratio, according to A. D. Spillman, assistant manager, sales application department, Philadelphia Electric Co., who mentioned in passing that there are 25 water-source heat pump installations in this city.

Spillman briefly described an installation using two 60-hp. machines and operating with 45° water for cooling, 115° water for heating.

On the subject of night setback, Spillman stated flatly that studies had shown this practice to be uneconomical when used with heat pumps. "When temperatures are maintained constant, say at 74°, total cost is lower, occupant comfort is highest."

In the general discussion from the floor after the formal presentations, several significant pieces of miscellaneous information were presented:

On a $660,000 heat pump installation, comprehensive estimates of several conventional heating-cooling methods were within plus or minus $2,000.

Sixteen 5-ton heat pumps were installed at a cost of less than $600/ton.

Cost of process steam versus electricity to drive heat pumps is under investigation. No figures yet.

Reciprocating compressors must be stopped once or twice a year for repair on large systems. This is not so with centrifugals. What work is being done to increase reliability of reciprocals for year-round service? No answer.

Will coils have to be oversized to heat with relatively low temperature water? No, coils are sized for cooling and give adequate heating with 100° water.

A 15-ton heat pump is running successfully on sea water; only the water regulating valve is giving trouble.

In one major heat pump installation, the cost of heating with oil at 15 cents a gal. would be higher than heat pump costs.

Ranney Names Peck Engineering V. P.

GREENVILLE, Mich. — Fred G. Peck was recently named vice president - engineering by the board of directors of Ranney Refrigerator Co., it has been announced.

F. G. Peck

Peck was formerly employed by Victor Products Corp. and joined Ranney Refrigerator as chief engineer in November, 1952.

He is active in the American Society of Refrigerating Engineers and is currently serving as a member of the General Technical Committee. Also, he is an associate editor of the Refrigeration Equipment Data Book.

Wall Tube Appoints Merle J. Holst

NEWPORT, Tenn.—Appointment of Merle J. Holst as sales manager, refrigeration products, Wall Tube & Metal Products Co., was announced by John F. Ault, executive vice president.

M. J. Holst

Holst is a graduate of the University of Michigan Mechanical Engineering college, and is a member of the ASRE. He has been active in many phases of management with Wall Tube in the past ten years.

In his new capacity, Holst will be responsible for the sale of the company's products to original refrigeration equipment manufacturers.

You Asked About It

I have just read your "You Asked About It" and find a serviceman experiencing troubles similar to mine in fixing leaks in aluminum pipes and evaporators.

I have been quite successful in using 1/16-in. aluminum rod in welding the aluminum. However, I have found no one who knows how to make a copper-to-aluminum weld. I have tried several ways and am wondering if the manufacturers or someone can give us some information to remedy this problem in the field.

Customers with $500-$600 combination refrigerator-freezers don't like to throw them away when they are five or six years old because they develop a leak.

The field desperately needs information pertaining to this type of work.

D.R.S.—Wenatchee, Wash.

Q. We are attempting to set up a maintenance program for compressors and air conditioning equipment. Is there an available check list of items that could be used by the serviceman when he is doing the monthly check on the job? In our opinion, this should be a list of items to be serviced on a compressor with a space given for comments.

P.A.—Flint, Mich.

There is no standard form giving the type of information you request. Your best bet would be to get hold of several "check, start, and run" forms which are issued by the manufacturers of specific equipment. These forms list the many things to look for in compressor and air conditioning equipment operation, and you can derive your own form from them.

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The Stewart-Warner Franchise offers—

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2. A complete line of quality products, covering all residential and small commercial heating and cooling requirements... no need to handle a variety of lines. Included is a special group of year 'round air conditioning furnaces designed specifically for the large scale builder.
3. An organization here to stay...with a half century's reputation for highest grade manufacturing, integrity and stability.
4. A Training Institute, plus sales promotion material, which enable dealers to do a successful selling job.

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The Stewart-Warner Training Institute was conceived and developed to assure the proper education of Stewart-Warner dealers and their personnel. It is housed in a specially designed and equipped building at Lebanon, Indiana. The courses cover products and selling procedures which have proved successful in the field. Engineering courses are also given which cover system design, installation and service.

Students are trained to sell the features of Stewart-Warner equipment under the guidance of factory experts. The school has cut-away samples of virtually all products in the line which enable the student to rapidly acquire a thorough knowledge of the equipment.

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Saf-Aire "Safety Sealed" Gas Heaters

Residential and Commercial Cooling Equipment

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Also, make $10,000 to $12,000 a year proven figures.

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We handle and arrange all installment credit, and make all collections.

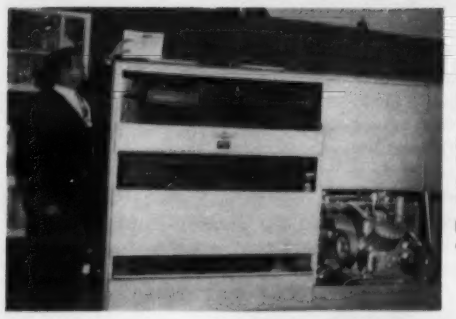
- No holdbacks—full commission paid each Friday.
- Can you give satisfactory character references?
- This is positively a permanent connection with a well-established firm, well-known line, well-financed.
- Our employees know of this advertisement.
- Write giving full details, references and photo.

Waters Equipment Co., Inc.

Attention: R. C. Waters, V. P.
P. O. Box 10013
Tampa, Florida

Heating, Cooling, Ventilating Products Spotlighted at ASHAE Exposition

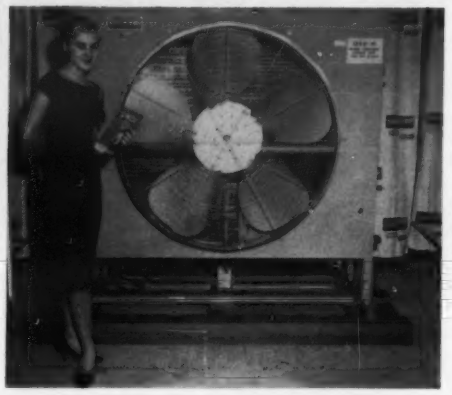
NO DISCOLORATION at all on the new synthetic insulation used in General Electric motors, in contrast to darkened normal insulation is shown by Jan March, Upper Darby, Pa. Motors were run for six months at 140° with R-22.



SHORTER BY half the length of the NEWS is the new Governair Corp.'s CPS Chiller. Wayne Smith, applications engineer, shows the height of previous models. The new chiller, a 10-ton, self-contained evaporative condenser chiller assembly is also 15 in. shorter.

AN OPERATING OSCILLOSCOPE showed visually the noise reducing effect of the "Duct Silencer" produced by Industrial Acoustics Co., Inc. Sy Wasserman, project engineer, points to change of pattern on scope as Nick Necastro, Fort Worth, Texas, listens to the change in sound level.

LOW PRESSURE oil burning system, incorporating vaporizing oil burner, modulating control, electric ignition, and forced draft, is described by Bob Law and Nels Port of Controls Co. of America. The "Gyropac" system is designed primarily for residential use.



BLOWER-CONDENSER package, a 10-ton model, was one of new products introduced by Dunham-Bush. Irene Coleman holds literature describing this series.

NEW FOUR-WAY reversing valve for heat pump and hot gas applications is demonstrated by V. V. Solomon, Alco Valve Co. field engineer (l.), to Joe A. Marchese of Marchese Refrigeration, Pittsburgh.

NEW DESIGN, NEW dimensions distinguish Trane Co.'s line of package air conditioners. Convertible fan section is pointed out by A. J. Hackl, and another feature is replaceable refrigeration cycle.

LIGHTING AND AIR distributing fixture all in one piece was among the diffuser types shown by Multi-Vent Div., Pyle-National Co.

Flooded ammonia installation engineered by Theis Refrigeration blast freezes 25,000 lbs. of chicken daily at -30° F.

For all refrigerants, including ammonia and brines.

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eliminates ceiling frosting and slugging hazards

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Engineers and contractors find these Krack defrost units cost less to install and require less maintenance.

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Refrigeration Problems
And Their Solution
(As Written by Paul Reed)

Compressor Damage by Faulty Flow

QUESTION:

We are having trouble with compressors sticking and burning out on an air conditioning installation. It is a conventional installation using a water-cooled unit and a direct expansion finned coil. The compressor is started and stopped by a low-pressure control.

However, instead of a solenoid valve in the liquid line, actuated by a room thermostat, there is a modulating valve in the liquid line that is actuated by a modulating type thermostat in the room.

This modulating valve is just ahead of the thermostatic expansion valve in the liquid line, and is for reducing the compressor capacity as the refrigeration load falls off. When the thermostat is calling for full capacity, the modulating valve is wide open.

Most of the time, however, the modulating thermostat is calling for only about 10%, 25%, or 50% capacity, so the TEV is feeding the coil in the same percentage. The low pressure control is set very low, so as to stop the compressor when the modulating thermostat is calling for very little refrigeration so consequently the modulating valve in the liquid line is barely opened.

If you can tell from the above description of the conditions, what can be causing the compressors to stick and burn out, we will appreciate receiving the information.

ANSWER:

Your trouble is probably due to inadequate oil return when the load is very low, and the modulating thermostat and modulating valve in the liquid line are both acting to allow very little liquid refrigerant to flow through the TEV and into the evaporator.

This results in a low refrigerant velocity through the evaporator; too low in fact to keep the oil moving through the evaporator, and consequently the evaporator becomes oil logged.

When the load increases, the modulating thermostat and valve open much wider, feeding enough refrigerant to the coil to cause a high enough refrigerant velocity to return the excess oil in the evaporator, to the compressor.

But the compressor is damaged by lack of oil during the time when the refrigerant was modulated to give 10%, 25%, or 50% capacity.

If the compressor is equipped with an oil level sight glass, the low level would probably be observed during the times of low load demand and low capacity as brought about by the modulation of the liquid to the TEV. Possibly this does not happen very often; but it happens often enough and of long enough duration, that the compressor is damaged.

It is quite likely that when this installation was designed, it was not expected that the capacity modulation would ever, or at least very often, be below 50%. With occasional modulation of capacity down to 75% or thereabouts, there would not be enough reduction of refrigerant velocity through the evaporator to cause sufficient oil logging in the evaporator to cause compressor damage.

Apparently, modulation of capacity down to 10%, 25%, or less than 50% occurs often and long enough to result in the evaporator robbing the compressor sufficiently of oil to damage the compressor.

Capacity reduction sufficient to match load reduction of only a few per cent does not present very serious problems of oil return on installations that have been properly designed originally for adequate oil return.

Nevertheless, attempting to operate an installation at only 10%, 25%, or even up to 50% of normal capacity, does present unexpected problems, and you have run into one of these problems.

Even without the oil logging, there is another condition that is contributing to your trouble. That is the excessive superheat in the suction gas to the compressor.

On a normal direct expansion air conditioning installation such as this one, there is ordinarily about 25° or 30° of superheat in the suction gas to the compressor. During the periods of low load and low capacity—and low suction pressure—there may be as much as 50° or 60°, or even more, of superheat in the suction gas.

This additional superheat in the suction gas causes the compressor to heat much more than normal, so much more, that the oil is thinned and loses much of its value. Consequently, the compressor is damaged.

SUGGESTED REMEDIES

As mentioned above, it is difficult to maintain efficient operating conditions when it is necessary to allow for capacity reduction down to 25% or less of normal capacity. However, there are some things that you can do to help.

Check the installation over carefully to see that there are no conditions, such as oil pockets in which oil can gather; that is, such places that can be eliminated. If good piping practices are being violated, make corrections.

Possibly some oil could be added to the system without causing excessive oil slugging and excessive oil logging during the times when the installation is operating at full capacity.

Quite possibly this installation is being operated with less oil than it will stand and still operate efficiently.

Investigate the possibility of putting in a motorized damper in the fresh air intake (if any) and controlling this damper by a modulating thermostat. Perhaps you can use the same modulating thermostat that you are now using to actuate the modulating valve in the liquid line.

As the load falls off, allow the fresh air damper to let in more fresh air, and this will probably increase the load and keep suction pressure above 30 p.s.i.g.

If you are unable to increase the load by increasing the amount of fresh air, you might remove the modulating thermostat and valve and replace them with an off-on thermostat and liquid line solenoid valve.

Then provide capacity reduction by the use of a constant outlet pressure valve, similar to an automatic expansion valve, in a by-pass line from compressor discharge to compressor suction.

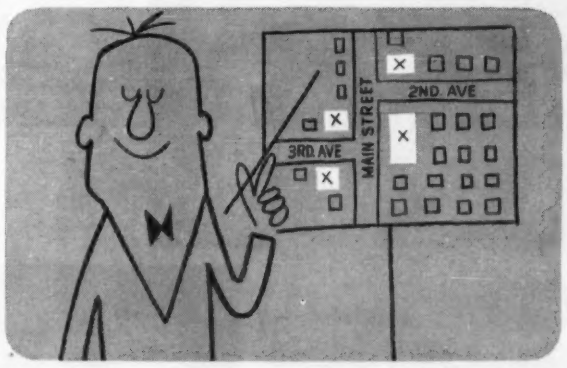
Set this valve for about 30 to 35 p.s.i.g.; that is, high enough to maintain an evaporator temperature of above 32°.

There are several precautions to be observed in the use of this method. One is to guard against damage to the compressor—particularly the valves—by reason of the excessive superheat in the hot gas by-passed from the compressor discharge.

Another precaution to be taken is to be sure to provide a valve with a large enough orifice to pass a sufficient amount of hot gas. Still another precaution is to see that the valve itself will stand the temperatures of the hot gas to be by-passed. The manufacturer of the valve should be consulted.

Some automobile manufacturers are by-passing from the outlet of the condenser instead of from the compressor discharge. This has an advantage of reducing the amount of superheat in the by-passed refrigerant. Also a valve with smaller orifice can be used.

Steady extra profit all year, better service for your customers—with a new kind of water treatment service



Anyone owning a water-cooled air-conditioning or refrigeration system is a prospect. Many prospects who need this service are right in your own community. Many of your *own* customers need it. Fits in perfectly with the services you now offer. Makes you an all-around expert, brings in extra revenue, establishes you more solidly with your customers.

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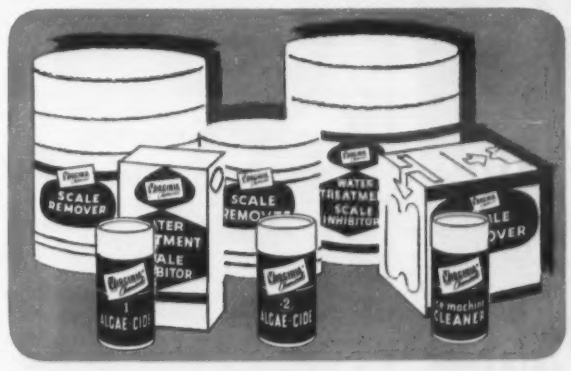

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Apparatus Distributors Named as Airtemp Closes New York Branch

PHILADELPHIA—Announcement of the closing of Chrysler Airtemp's New York factory branch and appointment of Apparatus Distributors, Inc. as exclusive distributor for the firm's commercial and residential packaged air conditioning and heating line in the New York area was made here recently by J. B. Ogden, Airtemp vice president-sales.

The announcement coincided with the 14th International Heating and Air Conditioning Exposition held here recently.

"This latest action is in complete accord with our previously announced policy of stabilizing our distribution pattern through independently owned and operated wholesale distributors," Ogden explained. "We intend to pursue that policy wherever possible," he added.

Apparatus Distributors has 120 dealers located throughout New York City; Westchester, Duchess, Nassau, and Suffolk counties, N. Y.; and Fairfield county, Conn. Recently its headquarters were moved to a new, 125,000-sq. ft. office building and warehouse located at 44-22 54th Ave., Maspeth, N. Y.

Top officers include Louis Lidsky, president; Michael S. Morris, executive vice president; and Jake Stockinger, general sales manager.

Apparatus Distributors had handled a competitive line until signing with Airtemp.

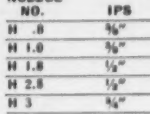
The shift to independent distribution of Airtemp's packaged commercial and residential products in New York closed the firm's largest branch outlet, located since 1956 in Ridgefield, N. J.

Ogden said Larry H. Baker, branch manager, will return to Airtemp's home offices in Dayton for new assignment.

The New York Branch is the second Airtemp factory outlet to give way to an independent distributor in the past two months. On Nov. 30 of last year, the Dayton branch was closed and the General Air Supply Co. franchised as the local wholesale distributor.

Chrysler Airtemp currently has only six branch outlets in operation: Miami, New Orleans, Houston, Indianapolis, Kansas City, and Detroit.

REPRINTS
SELLING FOR PROFIT.
By Frank Klein—Only $1.00 ea. Clip this ad and mail with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.



IMPROVED HYDRO HOLLOW CONE SPRAY NOZZLES CAN'T CORRODE

Spraying Starts Below ½ PSI
Injection Molded of "Tenite" (Butyrate)

NOZZLE NO.	IPS	GPM AT & PSI	SPRAY ANGLE
H .8	⅛"	.8	60°
H 1.0	⅛"	1.15	75°
H 1.8	¼"	1.8	90°
H 2.8	¼"	2.5	100°
H 3	⅜"	3.3	76°
H 5	⅜"	5.0	85°
H 7	⅜"	7.0	100°

AUSTIN MANUFACTURING CORPORATION
305 Perry Brooks Bldg. Austin 1, Texas

M. G. Eggett Joins Holladay & Westcott

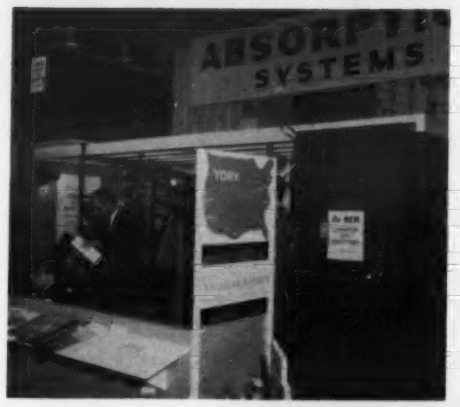
LOS ANGELES—Matthew G. Eggett, chemical engineer, has joined the firm of Holladay & Westcott, consulting engineer.

Since 1950 he has been assistant executive officer of the State of California Regional Water Pollution Control Board No. 4.

Eggett's efforts will be in the fields of waste disposal and water treatment. Holladay & Westcott is expanding its activities in these fields.

The firm also offers specialized engineering services in the fields of air conditioning, refrigeration, industrial processes, heat transfer, and chemical industry processing.

What Was New In Philadelphia



AIR-COOLED CONDENSING UNIT that will operate at 0° F. (upper left) and commercial air conditioning unit cally or horizontally (r.) that can be installed vertiwere new in the York Corp. booth.

"HIDE AWAY" FAN COIL UNITS for apartment buildings is described by G. W. Osheroff, Omaha, Neb., who recently installed 128 units. R. L. Wintroub, assistant sales manager of Hastings Air Control, Inc., which produces the units, listens as Osheroff waxes enthusiastic.

PRODUCTION OF the "Genetron" line of refrigerants at General Chemicals Div., Allied Chemical Corp. plants, was depicted in the company's exhibit with colored photographs, and is viewed here by Charles B. Price, representative in Detroit; Lydia O'Connor; and Joe Simons, Joseph Simons Co., Hartford, Conn.

LARGEST PACKAGE CHILLER EVER BUILT—reciprocating type—is the claim made by the president of F. C. Schnacke, Inc., for this 20-ft. long, 4½-ft. wide unit having four motors which supply up to 300 tons of refrigeration with R-22.

CENTRAL PLANT air conditioner, blower and coil assemblies for large installations, were shown by Thermal Engineering Corp. Kitty Stroup shows off a model rated at 5,000 c.f.m. air moving capacity.

SIMPLE CHANGEOVER from heating to cooling or vice versa in chilled and hot water room air conditioning system, was demonstrated by special demonstration device attached to a National-U.S. Radiator Corp. unit. Trying it out are Ira Duckett and W. D. Braden.

'Copper and Copper Alloy Metalexicon' Published

WATERBURY, Conn. — A lexicon "to untangle the complex terminology applied to brass mill products" is now available in booklet form, it has been announced.

American Brass Co. announcess publication of a 24-page, illustrated "Copper & Copper Alloy Metalexicon." It is available free of charge. Requests for copies should be addressed to Dept. SBR, The American Brass Co., Waterbury 20, Conn.

LOW SILHOUETTE air-cooled condensing unit assembly displayed by United States Air Conditioning Corp. brings together William Moiselle of UsAirco (l.) and Anthony Erbetta of Medford, Mass.

4 Ways Viking Gives You MORE — yours for the asking!

1 Industry's Only Blower Bearing with Built-in Journal
Lighter loading, longer life.

2 Industry's Only Interchangeable, Non-flexing Wheels
9" through 15" sizes; for quiet hi-speeds.

3 Industry's Most Advanced Private Research Facilities
At your disposal for air development problems.

4 Industry's Best Technical Information Service for Design Engineers
All you need to know about air movement.

Gentlemen: Please send me more information about item 1 2 3 4*
* Put me on the mailing list.
Name _____
Title _____
Firm _____
Address _____
City _____ State _____

VIKING AIR PRODUCTS
5601 Walworth Ave.
Cleveland 2, Ohio
9" through 15" Blowers, Blower Wheels, Furnace Humidifiers

BETTER NOT CALL IT A BIBLE

But the famous Harry Alter *Dependabook* is really the standard buying guide of the trade. It's the most complete refrigeration and air conditioning supply catalog in the whole industry. It is especially designed for your convenience. (Even has your net cost on every item to save time in pricing a job.) For the newest products and latest prices always use the *Dependabook*.

We're Real Specialists in
REFRIGERATION · AIR CONDITIONING · ELECTRIC MOTORS
SUPPLIES and PARTS

SAVE MONEY, time and effort by ordering from our new *Dependabook*, the most complete catalog of all. 160 pages. Over 10,000 items carried in stock. *Wholesale only.* Your orders filled really fast by mail, or picked up at one of six big warehouses.

Write on your letterhead for the 1959 DEPENDABOOK . . .
Also our monthly Flyer of surplus and close-out Bargains.

The HARRY ALTER CO., Inc. Chicago 16, Ill. 1717 S. Wabash Ave. | New York 13, N. Y. 134 Lafayette St. | Dallas 7, Tex. 122 Parkhouse St. | Atlanta 10, Ga. 690 Stewart Ave. S.W.
FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG WAREHOUSES

ASHAE Show Offered Galaxy of New Equipment, Experts To Explain It

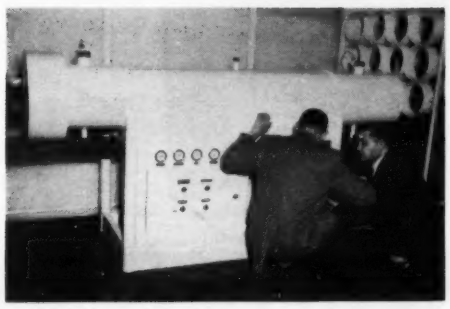
Pictures on this and several other pages of this issue are of products shown at the International Heating and Air Conditioning Exposition recently held in Philadelphia. For further information on any of these products please write the manufacturer. Additional picture coverage of the show appeared in the Feb. 9 issue and more will appear in a future issue.

THE AUTOMOBILE depicted in the "Freon" Products Div. of Du Pont exhibit is the air conditioned station wagon which is the first prize in the contest which the division is now conducting. Lorna Ringler gave out entry blanks to contractors and servicemen, who as customers of air conditioning and refrigeration supplies wholesalers, are eligible to participate in the contest.

ELIMINATION OF WATER HAMMER is claimed for Jackes-Evans Mfg. Co.'s 3-way fan coil control valve. Here J-E vice president and sales manager John Marling explains to W. W. Hull, St. Louis, that the valve is supplied in capacity ranges from ½ to 10 g.p.m. and will operate at a maximum pressure differential of 25 p.s.i.

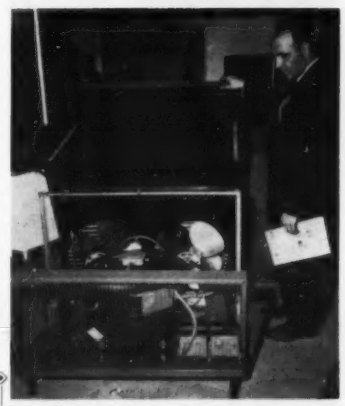
INSERT DUCT HEATER, 3 or 5 kw., for use with 240 or 208-volt single or 3-phase current, is offered by Electromode Div., Commercial Controls Corp., and is checked over here by Lorna Ringler.

PUSHBUTTON INDICATOR panel for use with a Johnson Service Co. pneumatic control system used in large air conditioning systems, permitting the operator to tell in an instant conditions in various parts of the system, gets a tryout from A. A. Franse, visitor to the Exposition from Rotterdam, Holland.



NEW AAF PACKAGED LIQUID CHILLER, with hermetic compressor in sizes from 20 to 60 tons and open compressor in sizes from 60 to 150 tons is shown by Boris Kaufman of American Air Filter Co. (l.) to Herman Fessler of United States Air Conditioning Corp.

SALES TIPS on Heat Controller, Inc. self-contained 3-hp. heat pump are offered by J. A. Knight (r.), company president, to R. P. Cook, new regional manager for the southern United States with offices in Tampa, Fla.



HINGED-ON COVER which slides back to permit ready access to unit is a feature of Stewart-Warner 5-hp. single-phase remote condensing unit assembly, being inspected here by James D'Agata of Rockville, Conn.

Ranco Quarter Nets $6,328,938 In Sales

COLUMBUS, Ohio — Consolidated net sales of Ranco, Inc. in the first quarter ended Dec. 31, 1958 amounted to $6,328,938 as compared with $6,040,477 in the same quarter of the prior year.

Consolidated net earnings were $455,953 compared with $377,829 a year ago.

ALUMALIFT

primarily designed for the installation and servicing of Air Conditioners in transoms

Total weight only 50 lbs.
Will raise unit from 36" to 108"

No servicing company can afford to be without one

Dealers and Distributors write for particulars

AMBLE 157-06 NORTHERN BLVD. Flushing, N. Y.

PROVEN BEST!

FOR ALL MAKES OF ICE MACHINES

VAPCO

ICE MACHINE CLEANER

The ORIGINAL LIQUID Ice Machine Cleaner. Works fast yet safely. Produces FRESH SMELLING flakes and cubes.

No danger from toxic residues because it's FOOD GRADE. Simple and safe to use with ANY machine.

1. Goes into solution quickly — even in COLD water.
2. No undissolved crystals left.
3. Removes more scale per ounce of cleaner.
4. Easy to use.

8 fl. oz. bottles and 200 lb. Drums

GUARANTEED Vapco PRODUCTS

Complete literature on request or see your dealer TODAY!

GARMAN COMPANY ST. LOUIS 23, MO

DOES YOUR APPLIANCE CARRY THIS SEAL of QUALITY?

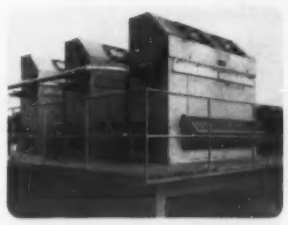
☆ The motor used in this equipment is protected against overloads, low voltage, over-voltage with a Mighty Mite Thermal Protector ☆

MECHANICAL INDUSTRIES PRODUCTION COMPANY
223 Ash Street • Akron, Ohio

WANT DEPENDABLE COOLING EQUIPMENT?

Check FRICK Refrigeration FOR ALL YOUR NEEDS

- ☑ CONDENSERS
- ☑ PIPE COILS
- ☑ SHELL-ICE MAKERS
- ☑ VALVES & FITTINGS
- ☑ ICE RESERVE UNITS
- ☑ AIR HANDLING UNITS
- ☑ SHELL & TUBE COOLERS
- ☑ "ECLIPSE" COMPRESSORS
- ☑ HEAVY-DUTY COMPRESSORS
- ☑ QUICK-FREEZING SYSTEMS
- ☑ "INSTANT" WATER COOLERS
- ☑ MULTI-STAGE COMPRESSOR SYSTEMS
- ☑ LOW PRESSURE REFRIGERATION UNITS
- ☑ AUTOMATIC CONTROLS & DEFROSTING SYSTEMS
- ☑ ☑ COMPLETELY ENGINEERED SYSTEMS, DELIVERED AND INSTALLED



Frick Evaporative Condensers Save Up to 95% of the Water Used.

Frick compressors handle any load with any refrigerant, at any temperature.

Frick Shell-Ice—Clear Solid Pieces of Curved Ice. Made Automatically, Without Snow or Waste.

Whatever your refrigeration requirements — quick freezing, ice making, cold storage, humidity control, low temperatures, condensing, air conditioning, or any process cooling — Frick equipment is the ultimate answer . . . and Frick engineers will design a system to meet your exact needs.

Frick equipment is world renowned for a long trouble-free life of dependable operation. Many Frick compressors have been in operation over 40 years.

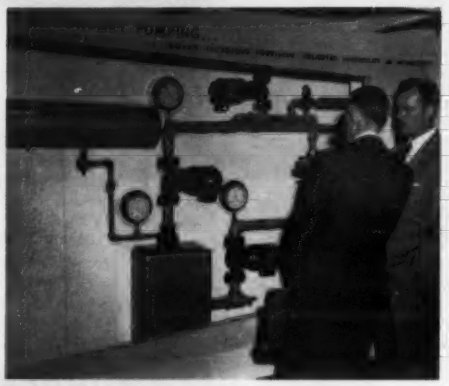
Some franchises still available for desirable territories.

Write . . . Wire . . . Phone Today to . . .

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U.S.A.

Explanations, Demonstrations Prevalent at Philadelphia

UNDER-WINDOW TYPE dual duct mixing unit is described by Sales Engineer R. Sandler, Buensod Stacey, Inc., who explains that the unit will deliver 70 to 600 c.f.m.



ADVANTAGES OF putting circulating pump on supply side rather than return side of closed hot water heating system are explained by Henry Henke, marketing manager for Bell & Gossett Co. (r.), to a show visitor.

NAME YOUR SHAPE (in a diffuser or grille, that is) and the Carnes Corp. will supply it. Wide range of louver designs is also provided.

GAS-FIRED YEAR-ROUND air conditioner is this Arkla Air Conditioning Corp. model providing 3½ tons of cooling, and rated at 120,000 B.t.u. for heating. Checking it over are Gene Kreitzburg, J. Frank Baum, and J. H. Baum, visitors to the Show from Ohio.

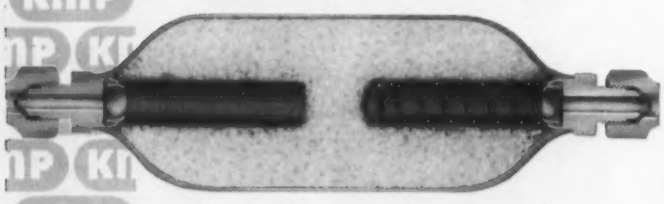
COMPRESSED AIR AFTER-COOLER which allows close control of air dewpoint and temperature is described by K. E. Dahl, sales engineer, Niagara Blower Co., to James A. Birk, Wilmington, Del. (l.), and Jack E. Weber, also of Wilmington.

DELUXE HEATING, cooling thermostat and dehumidifier control displayed by Minneapolis-Honeywell Regulator Co. brings inquiry from William D. Campbell of Burnham Corp. (r.) to J. Donald Reilly, manager of the M-H residential division in the New Jersey territory.

COMPLETELY PRE-CHARGED with refrigerant are all the components for Perfection Industries' model PAR-20, 23,000 B.t.u. capacity, remote residential air conditioning system. Carl Millsom of Perfection shows off the components.

ZONE CONTROL air conditioning cabinet, Buffalo Forge's type PCB, is a dry coil model rated for 75 tons of cooling effect and handling 10,000 c.f.m. of air.

IT'S 10 TO 1 THE REFRIGERATION EQUIPMENT YOU SERVICE HAS KMP® DRIERS WITH TRIPLE FILTRATION



Here's why...

Kenmore is the leading supplier to over 187 of the best known original equipment manufacturers. They use KMP driers because they are better . . . give triple filtration . . . use 100% of the desiccant whether molecular sieve or silica gel, because no additive or adhesives are used to form cartridge. Extra large filtering area, too—up to 22 square inches of micro-mesh monel wire cloth.

KMP Moisture Magnet® driers are easy to install . . . are trouble-free . . . reasonably priced. Only a few models needed to handle ¼ to 10 ton units.

See the KMP line at your refrigeration wholesaler

KMP KENMORE MACHINE PRODUCTS, INC.
LYONS, NEW YORK
Driers • Accumulators • Accumulator Driers • Strainers • Capillary Assemblies

Tired of snow?

JOBS IN FLORIDA

now open to qualified

GAS SALESMEN

New natural gas company with properties in Miami, Daytona Beach, Lakeland, Orlando, Jacksonville, etc., has immediate need for four Industrial Sales Engineers to develop a growing market. Liberal fringe benefits. Beginning salary commensurate with education and experience.

Six Commercial Sales Representatives needed to develop tremendous restaurant, hotel and commercial field.

Qualified gas air conditioning Sales Engineers also needed immediately.

Only qualified personnel with a minimum of five years recent experience need apply. Rush resume of personal data and detailed experience, starting salary requirements and availability. Address: H. H. Phipps, Manager Commercial and Air Conditioning Division

The Houston Corporation
P. O. Box 10400
St. Petersburg, Florida

NATURAL COMBINATION for all REFRIGERANT LEAKS

FIND IT WITH TRACE

An inexpensive fluid additive that "SPOTS" the smallest leaks with a brightly colored indicator seen through ice or frost.

FIX IT WITH *Leak Lock*

The joint sealer that seals when other compounds fail. Leaklock is easy to apply directly from its squeeze tube container, and stays put on any clean surface. It's permanently flexible to defeat vibration and expansion—never dries out or cracks, yet may be easily removed with alcohol, and can't "freeze" joints.

FORGET IT WITH CONFIDENCE

Leaklock and Trace are absolutely inert to Refrigeration systems...can't harm or be harmed by any refrigerant. Systems checked with Trace and sealed with Leaklock don't require expensive call-backs, and are saving time and trouble for thousands of contractors and servicemen every day.

See your Refrigeration Wholesaler For Trace and Leaklock or Write For Free Samples

HIGHSIDE CHEMICALS INC.
18 COLFAX AVENUE • CLIFTON, N. J.

Contract Award Hassle--

(Concluded from Page 1, Col. 3)

tors and public officials to question—in no uncertain terms—the wisdom of the award.

He explained that the low amount for air conditioning in the bid was due to what he termed "unbalanced bidding."

Fourteen firms entered bids on the housing project at the Marine Corps base. Opened early in December at Norfolk, Va., bids reportedly showed three to be low:

Atlantic Contractors, $13,000,000—$12,998,000 base construction, $1,000 to air condition the 800 units, and $1,000 to install certain types of screens; H. L. Coble Construction Co. of Greensboro, total $13,348,100—base $12,888,000, air conditioning $441,400, screens $18,700; T. A. Loving & Co., Goldsboro, total $13,477,000—base $12,997,000, air conditioning $443,000, screens $37,000.

The bid of Atlantic Contractors was certified acceptable by the Navy.

Protesters State Views

One of those who protested the bid—Robert Patten, managing director of the Carolinas Branch, Associated General Contractors—was quoted as saying that other bids for air conditioning and screens were more than $500,000 each. He called the Atlantic bid "highly irregular, unethical, and irresponsible."

Another protester—Sen. Sam J. Ervin, Jr. (D., N. C.)—put it this way in a letter to U. S. Comptroller Gen. Joseph Campbell: "I am certain that there is nobody on the North American continent who believes that a unit of Capehart housing can be air conditioned for $1.25."

The hassle made headlines in a number of newspapers. One story started out:

'2-Day Old Firm's' Qualifications Doubted

"Can a two-day-old construction company air condition 800 Capehart housing units for $1.25 each, when established firms estimate it will cost $666 per unit? Bargain basement air conditioning rates apparently was the deciding factor in the award of a . . . contract . . . to Atlantic Contractors. . . ."

Hayes, a native of Caldwell County, N. C., struck back at his critics, claiming they've "completely distorted the facts in the case." He continued:

"They're claiming that this corporation was only two days old and that it has a capital of only $25,000. They failed to mention that that's the way the government requires separate corporations for separate projects—we can either form a corporation before or after the bidding.

"They imply that we have inadequate bonding credit. I have the largest bonding credit of any individual builder in the country. I have over $2.5 million worth of assets back of this company, of which Hal B. Hayes, Contractor, Inc., is the parent company.

Hayes Says He's Done More of This Work Than Any Other Contractor

"They imply that I have inadequate experience. I have done more of this work than any other contractor in the country. I have more than $60 million worth of this kind of work under contract now."

Observing that he was thinking of taking action against his critics, he went on:

"They imply that the Navy gave us this contract illegally. We want to say that, because of the political pressure our competitors brought against us from the beginning, this job had more legal and expert checking than any contract we have heard of in the past."

What about the small amount in the bid for air conditioning?

"It is the total that a contract is awarded on. Nobody could air condition the quarters for the amount given.

"There is a legal limit of $13 million on this project. . . . Our original bid added up to within $2,000 of the legal limit. At that point we decided that because of our volume purchasing power and efficiency of building we could toss in the one-half million of air conditioning and other items for $2,000.

"It is known as unbalanced bidding and has been acceptable since the beginning of construction bidding."

At the time, Hayes was at Lake Tahoe where Zsa Zsa Gabor was appearing at a night club. Hayes reportedly is engaged to the actress. Later, she denied matrimonial intentions.

In Washington, a spokesman for Sen. Ervin said at press time last week that nothing had been heard so far on the contract award protests.

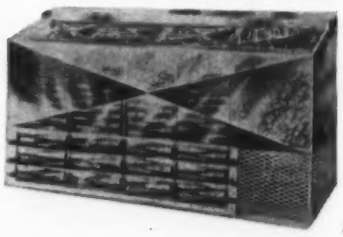
Copeland Report--

(Concluded from Page 1, Col. 5)

last fiscal year were $795,570, equal to 99.4 cents per share. However, 89.4 cents of this was earned in the second half of the fiscal year, pointing up the efficiencies effected by operations in the new factory building.

The engineering and manufacturing departments have been strengthened to augment product lines and improve manufacturing capabilities, the management states, and these efforts will be directed toward augmenting the Copeland line of compressors by increased horsepower sizes, advanced techniques for all temperature applications, and lower cost compressors.

"A CASE OF COOL JUDGMENT"



FLO-COLD DRINKMASTER

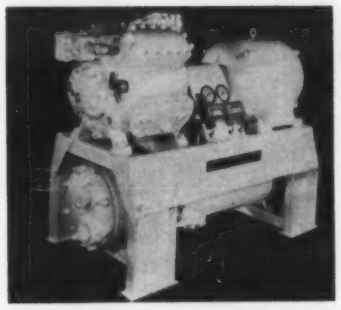
STAINLESS STEEL CUBER — COOLER.

SOLD THRU DEALERS ONLY WRITE

United Friguator Engrs.

MENOMINEE, MICH.

AVAILABLE IN SIZES 4 to 10 FT.



BELL & GOSSETT'S new refrigeration condensing units are built low and compact, and are claimed to be the shortest units available on the market today. Sizes range from 7½ to 150 tons' capacity.

Bell & Gossett--

(Concluded from Page 1, Col. 4)

that all parts and components in the new condensing units are manufactured by Bell & Gossett, thus facilitating part replacement and service. Components include compressor, motor, condenser, and base. Four compressor sizes (2, 4, 6, or 8 cylinders) are available.

"An additional feature of the condensing units is a complete interchangeability of all parts," the announcement said. "Part sizes in the components of small units are the same as those used in larger models, making it easy for the consumer to store spare parts for a multiple installation of various sized units."

Stating that the condensing units also feature rugged construction, the company said they can be lowered or raised, moved vertically or horizontally in an elevator shaft or outside a building, without risk of damage. The manufacturer also claims that a low center of gravity, with parts protected within a steel frame, insures against damage in shipment, handling, or installation.

"Moving parts and controls are located on top of each unit where they are easily accessible," the company said. "The units can be serviced with ordinary tools."

Recold 'Dri-Fan' Catalog Gives Nominal Ratings

LOS ANGELES — New Recold "Dri-Fan" evaporative condenser catalog 30C8c announces that "Dri-Fan" evaporative condensers with 60 different nominal ratings, between 4.7 and 232 tons, are now available for Refrigerant-12 and 22.

Nominal ratings are listed for condensers with optional desuperheat coils and for steel tube "Dri-Fan" evaporative condensers rated for Refrigerant-12 and 22. A selection of 32 nominal ratings for ammonia "Dri-Fan" evaporative condensers from 4.1 to 191 tons are also cataloged.

Information on the Recold patented Ammonia Oil Removing System, formerly listed on a separate catalog sheet, has also been included in this new catalog.

New Dallas Firm

DALLAS—Avery Air Conditioning, Inc. has begun business at 12987 N. Central Expressway, Richard J. Avery, Jr., president, announced.

The new firm is a Carrier dealership. Robert B. May is vice president.

'Customer Satisfaction Schools'--

(Concluded from Page 1, Col. 4)

U. S. in an attempt to reach the greatest number of dealers and distributors in the shortest period of time.

This course is an air conditioning course and will cover the six basic concepts that affect air conditioning—comfort, heat transfer, refrigeration cycle, piping, electricity, and air distribution. It will serve as a refresher course for the old timers, and as a basic course for new men.

It is designed for the dealer service mechanic, the installation man, the application engineer, the salesman, and the dealer principal. Each student receives a set of "Basic Concepts Manuals" presenting the six subjects in an entirely new approach.

Each student will also receive a home study requirement which, when turned in, will qualify him for the second semester advanced course. No student will be admitted to the second semester unless he has attended the first semester and completed the home study requirement.

The advanced course is designed to teach the service mechanic the "direct approach" method of analyzing air conditioning equipment problems. Classes will be held at permanent classrooms established in strategic locations throughout the country.

These five-day courses will have small classes so individual attention can be given to each student. Live equipment, bugged to offer realistic problems, will be used to teach the students how to analyze and diagnose problems found in the field.

Some of the subjects to be included in the course include brazing practices, use of instruments, acidity test, evacuation and charging, installation techniques (piping, location of components, air delivery including fan speeds and static pressure), electrical circuits and components, diagram reading, circuit testing, trouble shooting from a practical standpoint.

A number of the first semester schools have already been held. Schedule for the balance (with starting date) is:

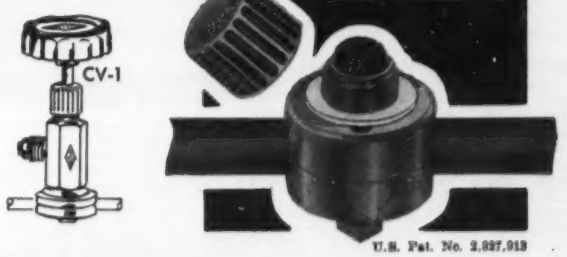
Feb. 16, San Francisco. Feb. 19, Portland, Ore. Feb. 23, Seattle. Feb. 26, Denver. March 2, Chicago and Milwaukee. March 5, Chicago, Boston, and Minneapolis. March 9, Indianapolis, Hartford, and Des Moines. March 12, Cleveland and Philadelphia. March 16, Pittsburgh and Newark. March 19, New York City. March 23, Schenectady.

Linde Names Behnke

NEW YORK CITY — Linde Co., Div. of Union Carbide Corp., announced appointment of E. R. Behnke as manager, "Molecular Sieve" products.

Behnke was formerly sales manager for these new materials. He is now responsible for sales, production, and technical development, with headquarters at the company's New Products Laboratory, Tonawanda, N. Y.

Custom ENGINEERED FOR YOUR INDIVIDUAL NEEDS



U.S. Pat. No. 2,827,913

WATSCO LINE TAP VALVES are easily installed on tubing to provide a permanent port for testing, charging or discharging. Available in 6 sizes ranging from ⅜" to ⅞", each valve is *custom designed* to fit its respective size line without distorting the tube. Exclusive 3 point sealing makes leakage almost impossible. Operated by Watsco Control Valve CV-1 or CV-2.

CAN TAP VALVE screws on to most all packaged refrigerant containers and pierces the can seal to release refrigerant. Easily shut off and sealed with Watsco Control Valve CV-1 or CV-2. Watsco's exclusive 3 point sealing allows you to use as much refrigerant as required with confidence that the balance will not leak from the can. The Can Tap valve may be left on until all the refrigerant is used, but the control valve may be removed and used for other jobs.

CAN TAP IS A LIFETIME VALVE.
NEEDLE IS REPLACEABLE
AT NOMINAL COST.

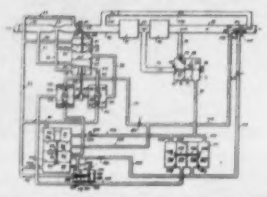
Send for Catalog
Write Dept. N-2

WATSCO INC.

1020 EAST 15th STREET, HIALEAH, FLORIDA

PATENTS

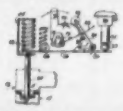
Week of Oct. 28 (Concluded)



2,858,075. AIR CONDITIONING CONTROL SYSTEM. Ernest G. Le May, Jr., and John E. Drake, Northport, N. Y., assignors to Fairchild Engine and Airplane Corp., Bay Shore, N. Y.

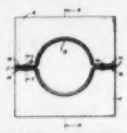
10. In an air conditioning system comprising a source of compressed air subject to variations in pressure connected to an input channel and an output channel connected to said input channel through two parallel channels, one of said parallel channels including a cooling means and the other of said parallel channels serving as a by-pass channel, the combination of a control valve in said by-pass channel. . . .

2,858,076. CONTROL MECHANISM. Estel C. Raney, Delaware, Ohio, assignor to Banco Inc., Columbus, Ohio.



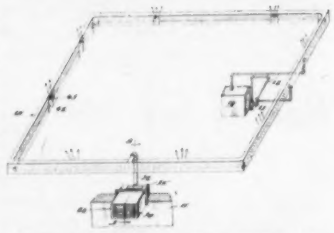
In a control mechanism having a control member movable between two control positions, an expansible element normally containing a thermally responsive fluid and having a part movable in response to changes in volume of the fluid therein, means forming a stop to limit movement of said part of said expansible element in one direction in response to decrease in volume of the fluid in said element. . . .

2,858,115. FINNED TUBING. Arthur Stebbins, Massapequa, N. Y.; Esther B. Stebbins, administratrix of said Arthur Stebbins, deceased.



1. Finned tubing for use in heat exchange apparatus comprising a pair of longitudinally extending semi-cylindrical members of relatively thin sheet metal, said members having a series of opposed spaced transverse slots extending through the wall of said members, each of said members having longitudinal flanges extending along its side edges, said flanges being secured together in abutting relationship to form a cylindrical tubing, and a series of half fins mounted on said members in abutting relation to said longitudinal flanges, said fins having edges co-extensive with said slots extending through said slots into and engaging the interior wall of the tubing.

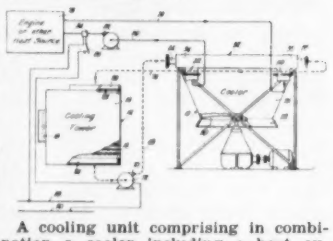
2,858,077. BUILDING HEATING AND COOLING SYSTEM. Lawrence J. Smith, Oak Park, Ill., assignor to Bell & Gossett Co., Morton Grove, Ill.



1. In a building heating system, the combination of a base board structure including a heating unit positioned for convection heating of the space to be serviced, and duct means in heat exchange relation to the heating unit and through which atmospheric air is adapted to flow by convection, the duct means having an opening for independently communicating with the space, and means for establishing a flow of air through said opening independently of the convection flow of air.

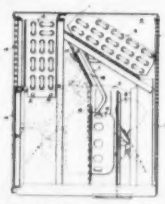
Week of Nov. 4

2,858,677. WATER COOLING APPARATUS. Richard J. Stone, Hickman Mills, Mo., assignor to The Marley Co., Kansas City, Mo.



A cooling unit comprising in combination a cooler including a heat exchanger having a pair of spaced, hollow headers provided with a series of spaced, exteriorly finned tubes interconnecting the same, fan means disposed to force air across the tubes to remove heat from the fins thereof, and a pipe telescoped through each tube respectively. . . .

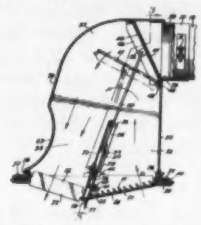
2,858,678. ROOM AIR CONDITIONER HAVING VENT CONTROL MEANS. Stanley E. Rose, Lyndon, Ky., assignor to General Electric Co., a corporation of New York.



1. An air conditioner for conditioning a room comprising a housing, a barrier dividing said housing into an outer compartment and an inner compartment, a condensing unit in said outer compartment, an evaporator in said inner compartment, a first air moving means for circulating a stream of air from said room through said inner compartment over said evaporator and discharging it back into said room. . . .

2,858,759. CEILING AIR MIXER CABINET AND METHOD OF HEATING. Jack W. Rice and Charles D. Mattingly, Wichita, Kan., assignors to The Coleman Co., Inc., Wichita, Kan.

1. In a heating system, a generally rectangular air mixer cabinet adapted to be mounted in an opening in the ceiling of a room, said cabinet having a pair of ports in the open bottom thereof adapted to be positioned ad-



jacent the ceiling of a room for communication with the room space, said ports being angularly related to each other with adjacent portions of each port being lower than the remote position. . . .

2,858,760. DIFFUSER. Harold F. Lathrop, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa.

1. In a diffuser for the outlet of an air duct, a casing substantially rectangular in plan open at its lower end and having flat side walls and a top wall, and substantially segmental deflectors cut from said top wall and integrally attached to the central portion thereof at their inner ends, said deflectors terminating short of said side walls and being individually bendable downwardly and inwardly of said casing within the height of the latter and to variable extent for varying the volume and angle of flow of air entering said casing through the openings in said top wall corresponding to said deflectors.

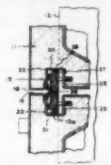
2,858,854. FLEXIBLE TUBING. Frederick K. Daggett, Pine Orchard, Conn., assignor to The Flexible Tubing Corp., Guilford, Conn.

6. A flexible tubing comprising a helix of wire supporting a composite covering consisting of a sheet of woven fiberglass having sheets of aluminum foil applied to the inner and outer faces of the woven fiberglass sheet and adhered thereto over the entire area thereof, the inner aluminum foil sheet being secured against movement relative to the coils of the wire helix axially of the latter.

Week of Nov. 11

2,859,495. REFRIGERATOR CABINET INCLUDING CLOSURE SEALING MEANS. Edward H. Roberts, Jeffersontown, Ky., assignor to General Electric Co., a corporation of New York.

In combination, a cabinet having a face portion defining an access opening to said cabinet, a plurality of closure members for closing said access opening and having shoulders overlying the face portion adjacent

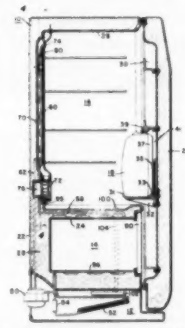


said access opening, adjacent closure members having opposed edges spaced from one another and extending across said access opening. . . .

2,859,496. REFRIGERATION APPARATUS. James K. Nelson, Grove City, Ohio, assignor to Westinghouse Electric Corp., East Pittsburgh.

4. A closure seal for a cabinet member having an access opening and a closure member movable with respect to said cabinet member for closing said opening; said closure seal comprising a magnetically attractable seat on one of said members. . . .

2,859,595. TWO TEMPERATURE REFRIGERATOR WITH FORCED AIR CIRCULATION. John M. Murphy and Leonard J. Mann, Dayton, Ohio, assignors to General Motors Corp., Detroit.



5. In a refrigerator, a cabinet having a compartment for the storage of unfrozen foods, means forming an air flue in one wall of said compartment, an evaporator in said air flue, refrigerant liquefying means connected to said evaporator for supplying liquid refrigerant to said evaporator. . .

(To Be Continued)

Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.

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ENGINEER REFRIGERATION Controls—To head a department on design and development of commercial refrigeration control valves of all types; national corporation with midwestern manufacturing and engineering facility; salary and bonus commensurate with work background and ability. Send full details, qualifications and personal data, to BOX A6172, Air Conditioning, Heating & Refrigeration News.

MANUFACTURER'S AGENTS for a complete line of air and water-cooled central air conditioning equipment, both commercial and residential. Desire agents already established in heating and air conditioning, calling on wholesalers with OEM accounts. Give details in first letter stating area covered and other lines handled. BOX A6177, Air Conditioning, Heating & Refrigeration News.

EXCELLENT OPPORTUNITY for above average trained service man, in sunny Florida, who has had two or more years' experience with Chrysler Airtemp heating and cooling equipment. Year round position, vacation, health insurance, open shop. In reply, state age, marital status and experience. Attach recent photo. BOX A6187, Air Conditioning, Heating & Refrigeration News.

WANTED — WHOLESALE salesman for a Carrier distributor located in large Mid-Western city. Must have air conditioning and heating background. Salary, percentage on sales and expenses. Write BOX A6188, Air Conditioning, Heating & Refrigeration News with complete resume and picture if possible.

REGIONAL SUPERVISOR in New York State for manufacturer of full line of commercial refrigeration to work with established dealers, wholesale grocery organizations, and to appoint new dealers. Experience in commercial refrigeration selling necessary. This can be a lifetime opportunity for the right man and initial compensation can be arranged to your satisfaction. Address BOX A6189, Air Conditioning, Heating & Refrigeration News.

ENGINEER TO operate small, household refrigerator cabinet manufacturing plant in Greece. Desire graduate engineer with refrigeration manufacturing experience. Should be able to speak Greek. Address BOX A6191, Air Conditioning, Heating & Refrigeration News with outline of qualifications and experience.

EQUIPMENT WANTED

WANTED NEW 3 and 5 h.p. self contained air conditioners with open drive compressors. Give full details. Write BOX A6186, Air Conditioning, Heating & Refrigeration News.

NEW OR used and repairable compressors, condensing units, valve plates, and parts for General Electric, Brunner, Carrier, Worthington, Copelametic, etc. Give Model No., Horsepower and full description. UNITED REFRIGERATION CORPORATION, 514 W. 12th St., Los Angeles 15, Calif.

EQUIPMENT FOR SALE

FOR SALE: Large quantity of refrigeration Kold Hold Plates. Less than distributor cost. Sizes: 79—22" x 30" and 74—22" x 48" at substantial savings under distributor costs. Brand new in original crates. Terms: C.O.D. or check with order. Write for prices. JOS. F. PALEN, INC., 112 Hennepin Ave., Minneapolis 1, Minnesota.

COMPLETE HIGHSIDE and low side refrigerator systems. P91 compressor 115 V. 50/60 cy. F-12 Evaporator: 15⅝" wide x 5⅝" high x 12¾" deep, and static condenser. S-88 compressor 115 volts 60 cy. Freon 12; Evaporator 11" wide x 11½" deep x 9" high, and static condenser. Systems are charged and ready for installation. Sold $36.00 each FOB Chicago, Illinois. Send for free catalog on money saving refrigeration values. WALTER W. STARR, 2833 Lincoln Ave., Chicago 13, Illinois.

BUSINESS OPPORTUNITIES

FOR SALE—Established Heating and Air Conditioning business on Florida's West Coast. Two nationally advertised franchises—over 500 satisfied customers. Owner has other interests. Asking price $25,000.00. BOX A6184, Air Conditioning, Heating & Refrigeration News.

MISCELLANEOUS

JOB SIGNS for air conditioning and refrigeration installation companies: Paraffin coated (weatherproof) cardboard size 20" x 14" in two colors. Large type used, fine layouts. Your signs displayed on your job builds prestige and invites inquiries. Price 100, $36.00, or 250 for $50.00. F.O.B. Indiana. Send for sample or send order. Enclose copy on letterhead. HOWARD WOLLER AND CO., 101 Ellwood Avenue, Mt. Vernon, New York.

CONTROLS & RELAYS repaired like new. UNITED CONTROL REPAIR COMPANY, new address: 151 E. 126th Street, New York 35, New York.

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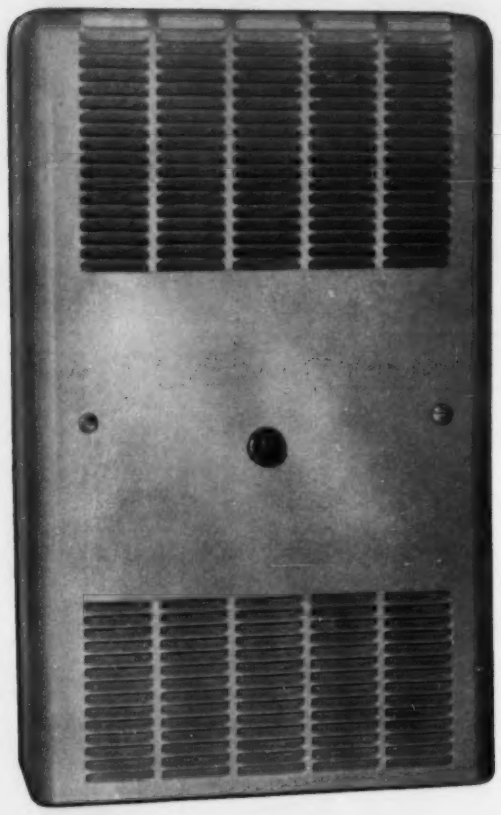
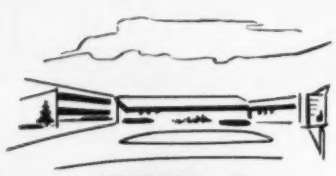
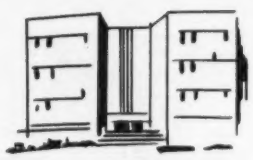


COOLING HEATING CONDITIONER



MOTELS

HOTELS



APARTMENTS

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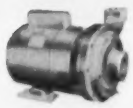

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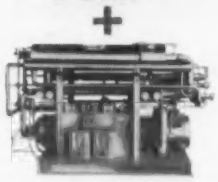

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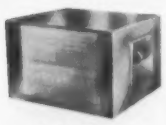

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